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COTTON

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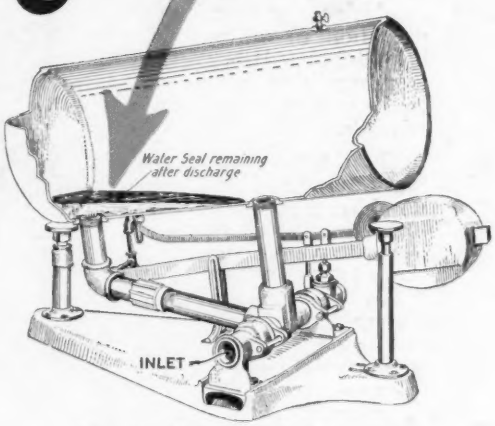
Dalton and Atlanta, Ga.

See That Seal!

No Steam Can Pass!



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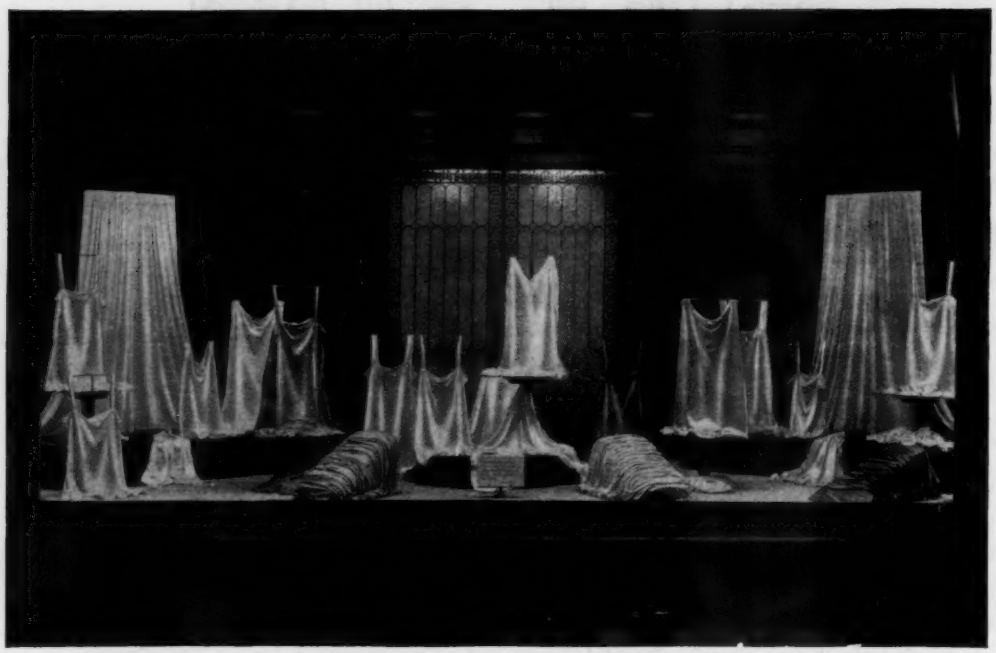

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THE glowing beauty of garments made with Celanese brand yarn is particularly evident in window displays such as the one pictured above. Invariably such displays produce rapid, profitable turnover. ¶This is why America's leading retail merchants constantly and enthusiastically feature "that amazing fabric, Celanese."

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BRAND YARNS

The AMERICAN CELLULOSE & CHEMICAL MANUFACTURING COMPANY, *Ltd*

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WORKS AT AMCELLE (NEAR CUMBERLAND) MARYLAND

SOUTHERN REPRESENTATIVE: TODD B. MEISENHEIMER
ROOM 1116, JOHNSTON BUILDING, CHARLOTTE, N. C.

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With the Publishers—

Rolling Up Mental Mileage

The ideal kitchen, a domestic science expert once told an audience of eager housewives, was one in which you could stand in the center and reach everything in it. She had spent many years of her life traveling back and forth across one of those huge farmhouse kitchens. She regretted wasting so much time in traveling when there were so many other more important things she wanted to do. Haven't you noticed the tendency of the kitchen-cabinet makers to emphasize how many steps —and they give figures, too—their equipment saves the women?

How many steps a day or year—or how many miles for that matter —does COTTON save a mill superintendent? Doesn't its monthly visit enable him to stand in the center of the textile industry and reach out for the salt of operation information? And by telling him what mills all over the field are doing, doesn't it free lots of his time for the other important things that he wants to do?

We'd like to hang a mental pedometer—one of those things suspended from your belt to tell how far you walk—or attach a mental speedometer to a mill man who studies his copies of COTTON regularly. Here's an idea on cutting costs that was used by a mill a hundred and fifty miles away. Here's a profitable suggestion on the care of machinery from a mill far across the country.

As examples of these suppose we consider the new automatic friction for slashers on page 155 of the issue of last December; or the ball bearing rocker shaft box for looms on another page of this number. These are but typical instances that could be multiplied many times in the course of a year.

What would have been the mill man's total mileage if he had been forced to go out and dig up all that information for himself?

Any figures concerning an inspection trip would have to take into consideration the long journeys that would be made in search of satisfactory equipment and supplies if the manufacturers were not advertising them in the pages of COTTON. Think how much time would be wasted in going from factory to factory in different parts of the country, inquiring about this machine or that article, only to be met with the reply:

"We don't make that. No, we don't know where you could get it."

But with the advertising announcements in COTTON you have right at hand all the ingredients of successful mill operation, as tested out in other mills, ready to be kneaded into your own business.

Speaking of COTTON, in a recent letter one knitting mill man says: "It is a path-finder for the textile manufacturers. Your 'Knitting Kinks' section is splendid."

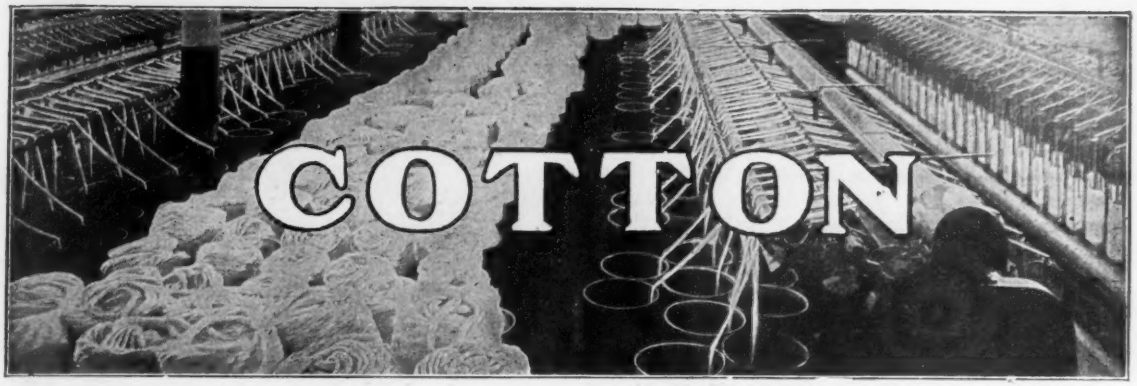
Yes, COTTON is as necessary and as handy to men in the textile industry as a kitchen cabinet is to the housewife of today.

AMONG COTTON'S READERS

L. H. Beck, Superintendent,
The Griffin Manufacturing Company,
Griffin, Georgia.

"I cannot refrain from congratulating you on the August issue of COTTON. It is one of the most creditable editions of any trade paper that I have ever seen. The articles are timely and well written. Especially interesting are the two contributions headed Wanted—A Prophet, and Life in the Mill in 1950. The departments contain some splendid articles, and all in all the magazine deserves the support of the textile industry."

L H Beck



February, Nineteen-Twenty-Six

Labor Moves Toward a Locarno.

It is not improbable that the name of the Swiss town where formerly warring European nations agreed last year on practicable means for preserving peace will become a symbolic term for describing other far-reaching cooperative moves along similar lines by big conflicting interests. Large segments of the American and international business groups have made much headway in setting up Locarno-like machinery for settling disputes outside of the courts. Now large groups of employers and employees take steps in a similar direction with the abolition of strikes and lock-outs in view.

The most constructive expression that ever came authentically from organized labor was when the American Federation of Labor at its last convention went on record for the principle that the workingman's hopes must rest principally on production. Hitherto, organized labor had trended towards the false contention that restricting production was profitable to it. Some branches of labor still hold to that view; many hold to it in part when they set the output of the slowest, or even the average, as a norm to be followed by all. But they gradually are learning that they suffer most of all from such false economics.

It is apparent that American labor also is learning that in the long run it suffers most from strikes. Organized railroad employees have agreed virtually to surrender that weapon once considered indispensable. The railroad companies have met them half way, with the result that there now is in Congress for confirmation by law a treaty of fixed peace that is perhaps more important than any of those arrived at in Europe. They agree to set up machinery, to be buttressed by Federal law, through which employers and employees will exhaust every means of negotiation, arbitration and outsider intervention in settling disagreements. If the arrangement is established it is unlikely that there ever again will be a big railroad strike, or even serious threat of one, in this country.

A peculiar public interest adheres to the transportation phase of the labor problem. The Railroad Labor Board is evidence of the public's determination to compel railroads and their employees to abide the public interest. But outright governmental control of relations between capital and labor is *per se* objectionable; it leads inevitably towards serious evils. It may be that an arrangement like that agreed on by the railroads and their workmen to take the place of governmental control is not workable —at least not now—in all other branches of big industry.

But the statesmen-like attitude of the heads of the railway brotherhoods will have much good effect on the rank and file of other groups of workingmen. It is likely that all will move more rapidly than formerly towards what might be called a Locarno—that is, arrangements whereby continued operations and consequent production will not be interrupted on account of disagreements between them and their employers.

The Futile Game of "Hold-Up."

Secretary Herbert Hoover of the United States Department of Commerce, with characteristic vigor and courage, fired a "shot heard around the world" when he launched a campaign against international monopolistic "controls" of materials, as have developed hugely in recent years.

These "controls" are current examples of what have been dreamed of, attempted and occasionally achieved since the beginning of commerce. They comprise the enforcement of agreements between producers and distributors of essential products to control output in ways that aim at the procuring of arbitrary prices independently of the ancient law of supply and demand.

In a history dealing with economics the story is told that, in the early days of modern commerce, Dutch merchants who, following the introduction of spices into Europe, controlled both the sources of supply and distribution of pepper, arranged to cut down one-half of the producing pepper trees in areas drawn upon in the East. The move was admittedly for the purpose of limiting supplies to the point where the Hollanders could get whatever prices they asked. London merchants met for the purpose of protesting against the move. Out of that meeting, so the story goes, came the British East India Company, out of which to a great extent came the British Empire. The Dutch merchants rendered themselves and their country a sorry service.

Rubber, around the British arbitrary "control" of which present discussions of the subject revolve, now comes in the main largely from the Far East chiefly because Brazil, which once controlled the supply of it, tried to maintain a despotic monopoly of that important material.

Brazilian coffee producers, aided by their government,

have tried repeatedly to control the supply and the prices of their product, which amounts to around 80 per cent of all the coffee entering world markets. The attempts usually have ended in disaster for the growers. The present one seems to be succeeding better than the others, largely because no doubt it isn't being carried to the extreme envisaged by others. One of the objections to it made by importers is that, if history repeats itself, the valorization of coffee ultimately will collapse and leave them with large stocks to dispose of at large losses in a demoralized market.

The first attempt in Yucatan to "hold up" the consumers of sisal, produced in the main there, ended in disaster. Another seems to be succeeding for the time being. But all of these efforts to set aside the law of supply and demand are fated to fail because, as Secretary Hoover has pointed out, "the beneficiaries are never content with the reasonable." Once a "control" scheme seems to work there arises out of the impulses of human nature a demand that it be "worked" to the limit. Thus the rubber "control," which was to "stabilize" the price of that product at around 35 cents a pound sent the price of rubber to the highest figures on record. And a result is a stimulation of competition which may threaten British supremacy in rubber production. Already, the percentage of the total supply coming from British territory has fallen from 75 to 52 per cent.

Although it may be taken for granted that attempts to "hold up" the world through monopoly control will fall, in the end, of their own weight, the agitation against them is timely and justifiable. Even though they fall, a lot of trouble is caused by them. And if carried on by the aid of government, as is the case with several now operating, there are in them certain political dangers that exceed in importance the economic ones. For questions of prices will thus inevitably become matters for diplomatic controversy, and this will lead towards wars. As a last resort in combating them, governments whose consumers are most affected would have to retaliate by backing similar "controls" of products put out chiefly by their peoples. There are several important ones—cotton, for instance—which this country might use in "holding up," for a while at least, the peoples of other lands.

There is now abroad much demand that our government give its aid to agricultural producers of surpluses for export in manipulating distribution so as to boost prices. It is not improbable that the present Congress will take a step in the direction of applying the "new economics," as now widely advocated, to some branches of agriculture. It is not easy for Congress to deny demands that it do so when the prospective beneficiaries are paying excessive prices for imported products on account of such adventures elsewhere.

The hope of the world, only now in the truly convalescent stage of recovery from war, is, as Secretary Hoover declares, production. World trade is now only of about the volume that it was twelve years ago when the war began. Anything that impedes production and distribution is *prima facie* bad. And any meddling with fundamental economic principles will do that.

So it is well that the country back up the Department of Commerce's combat on international monopolistic "controls." Most of them aim principally at American consumers who purchase the largest parts of nearly all the products so far involved in them.

It also is well that the country be on its guard against any adventures of like kind on its own part, whether in retaliation or independently of what others are doing.

History shows that humanity revolts instinctively against being "held up," at the point of economic as well as of metallic guns. And those who try to "hold up" the world usually in the end suffer most from the final results.

On Preparing for Future Wars.

There has been of late a lot of discussion of the nation's military health and of what would happen in case the country should be involved suddenly in another war. Extreme militarists aver that, owing to shortcomings in many respects, notably aircraft, and the exquisite development of machinery for making war, the country is in a melancholy and critically bad shape of unpreparedness.

Without leaning in the slightest towards the views of the extreme pacifists, it might be well to remark that no country really is ever "prepared" for war. If one ever was it was Germany in 1914—but events proved that such was not the case. The reason is that the instruments and methods of war-making can be anticipated only in part, and in some measure the better "prepared" it be the more difficult it is for a country to adjust itself to the unanticipated.

Between the militarist and the pacifist there is tenable middle-ground. The extremisms of neither of the opposing groups should be taken too seriously. All the fuss about future wars being conducted by instruments beyond control and combat is mostly wild imagination.

"The last war taught us," says the report of a committee which recently went into a phase of the subject, "that men cannot make a machine stronger than the spirit of man." The report contains another sentence equally as well framed and logical, to-wit: "The next war may start in the air but in all probability will wind up, as the last war did, in the mud." And the country's troops that can handle themselves best in the mud will be apt to win, as in the last and practically all past wars.

Speculation and Gambling.

It is rather generally agreed that much of the boom that has been reflected during the last year and a half by the financial pages of the newspapers owed to outright gambling. Beginning as legitimate speculation on the outcome of the last national election and the prosperous times which were ahead, the stock market boom became in much part a product of the pure gambling spirit. This is true, too, of real estate booms in several sections of the country. Apparently in neither field has gambling caused inflation to an extent that is dangerous nationally. Moreover, it has been confined to things which do not figure hugely in the integrals of the national economy. It doesn't matter much to the country as a whole how much persons may bet on what figure a stock market board may show at some future time or on how big become the population in the vicinity of a corner lot.

But when they begin to gamble hugely in the vital substances of life and business—the commodities—a dan-

ger signal should arise. Fortunately, to date there has been very little gambling and scarcely any inflation in the commodity realm. Production has gone along with demand, both growing naturally and healthfully. The danger always faced in good-time periods is of production being stimulated artificially by inflation. And once speculation in commodities turns into large-scale gambling this results. Production boosted by rapidly rising prices outruns consumption, abnormal surpluses accumulate, and collapse, in a period of depression for readjustment, becomes inevitable.

There is nothing of the kind in prospect now. In the opinion of the best students of the subject, even if the danger should arise measures of avoidance might be taken. The present banking system was devised with the view of providing instrumentalities for heading off such dangers. Those who administer the system no doubt are on the watch and if need be will take proper steps to check unhealthful inflation in the realm of commodities.

The outlook is for a long and exceptionally prosperous period. It might be said that the only threat is that of too much prosperity, or, rather, of the kind that is artificially produced. Such a threat can arise only when conditions are mighty good.

Some Yarn Mill Wastes

BY R. A. SONIAMAN.

IN THREE PARTS. PART THREE.

Twisting Waste.

Take the question of twister waste.. The ring twister is considered one of the simplest machines in the textile industry. And yet there is so much waste made on it, and it is such costly waste, too! Yes, a twister is a simple machine. But like many other things in the textile world the simplicity itself is a good deal of a relative affair.

The machine is so easily understood, and its gearing so readily mastered, that some men pooh-pooh rather contemptuously at everything connected with it. It may be well, then, for us to go somewhat into detail on the twister, just to show that mere simplicity of mechanical construction does not by any means indicate a simplicity in the handling of the waste problem.

Twister waste may be divided into five chief classes: 1—Due to faults in preceding processes, 2—Bobbin waste, 3—Spool waste, 4—Slack waste, 5—Lap waste.

Taking up No. 1, we find that this cause of waste may be roughly split into: (a) spinners' singles, (b) spinners' doubles, (c) spinners' mixes, (d) spoolers' mixes, (e) spoolers' singles, (f) spoolers' doubles, and (g) faulty filling of spools.

You will find that unless some system of following up these antecedent defects in the yarn be rigidly adhered to, so as to locate their sources and then reduce them to a minimum, they will be responsible for a good deal of the waste charged to the twisting room. A little investigation, a tabulation of the faults when found, and regular display of the faults themselves to Marie, Sarah, and Minna, will in time result in a more pleasing showing of the waste bill.

The next item, bobbin waste, is diversified as follows:

A Tangled bobbins,
- a-1 over the top,
- a-2 over the bottom,
- a-3 dug in at the bottom,
- a-4 bobbin-traverse rail not working properly.

B Soiled yarn,

C Cutting yarn from the bobbins.

You will find that tangled bobbins are brought about either by being pulled over the top by a careless operative, or through a disarrangement of the ring rails; furthermore, you will eventually admit that the old dope about eternal vigilance must be worked overtime if the rails are to be kept level—particularly on old frames.

Tangled bottoms are occasioned by the ring rails running too low; although sometimes this trouble originates when the bobbins are not pushed down to the seats on the spindles at the time of doffing. When ring rails do not go down to the bottom of the traverse, the bobbins present a dug-in appearance at this point. They do not occasion waste, however, until the next process, winding, and here, the bobbins often have to be cut off because they will not unwind.

Sticking ring rails make lumps which if they get to a certain size must be cut off because there is no possibility of their running off at the next process.

Under the caption of soiled yarn comes everything around a mill which can dirty the yarn. Oil and grease, rust, dirty water, bands lapping about the bobbin, careless operatives, are among the sources of this special waste-

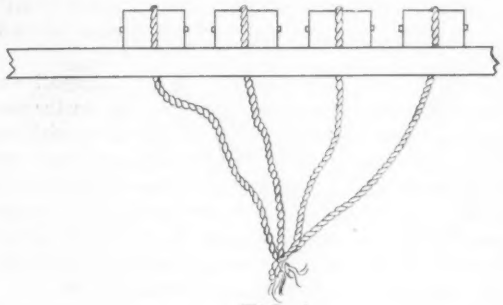


FIG. 1

maker. Water getting into the neck of the bottom roller journals and then issuing as a stream of rust causes a deal of damage.

Look at this worker's waste box! Three-quarters of the waste is cut waste. Cutting yarn from the bobbins is an evil that always has been existent in yarn making. And yet there are overseers who condone the practice of cutting off the yarn from the bobbins when they are slightly tangled or when the counts are not known. Needless to say, good manufacturing practice will not permit this.

Sometimes a deal of bobbin waste is made when the wrong twist or jackgear has been put on during a change of counts. A preventative of this type of waste is to have the section-hand test the twist immediately when the frame is started, the second-hand or overseer checking up after him.

Here's a doffer about to doff. And say! just look at the ends that have broken down on the frame. Notice how some of the other ends (Fig. 1) are whipping together. Now,

not an inconsiderable amount of waste is frequently made when the yarn balloons—as in this case—the ends under the stress of centrifugal force flaring out far enough to make contact with neighboring ends. In the clash that ensues, one end usually breaks and is instantly carried along with the other one, making the technical defect known as double yarn. Of course, all of this imperfect work must be removed from the bobbin before it can go to the next process.

Several causes, individually or in union, tend to bring this state of affairs about. These are: travelers too light, lubrication of rings when bobbins are nearly full, excessive humidity, and dry rings which result in ends snapping and catching a fellow end.

"I say, Nellie, what makes you try to fix that tangled spool? Your bad work always comes back to you, doesn't it? Of course it does! Well, it's only right, then, that a spooler tender's faulty work should go back to her. It isn't fair to you, to the company, or even to the spooler

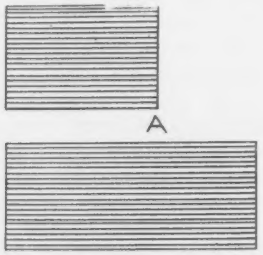


FIG. 2

girl herself if you do the fixing. Set all spools like that one out where they can be collected and returned to the spoolers."

Here is a pointer worth following up; for spool waste such as this girl was making is often found in the waste boxes on twisters because twister tenders often mistakenly believe that they are doing the spooler operatives a favor by not sending back their imperfect spools. You will find that by following up this matter that there will be less spool waste in the boxes and eventually less on the spoolers, because the spooler tenders realizing that their bad work is to be returned to them to fix, will be more careful.

Did you notice that the girl over in that second alley there was just going to cut off a pretty good sized spool when she suddenly spied us coming along and then made a bluff about the spool being tangled?

This obnoxious habit—cutting off the last few layers on the spools in the creels cannot be too severely censured. Just as soon as the workers find out that they can get away with cutting off, say just a few, one or two, layers on the spools, they'll get to cutting off more and more (some being bold enough to cut off as much as an eighth of a spool). And all this with the idea of saving themselves the trouble of coming back into the alley again a little later when the spool has become more nearly depleted.

It is easy to detect this waste in the boxes because your spool diameter being much smaller than that of the bottom roll, the length of the laps cut from the spools *A*, Fig. 2, will be shorter than those from the rolls *B*, Fig. 2. My advice then is that you subject the waste boxes to a periodical examination for this particular type of waste.

One of the most annoying waste makers which you will have to contend with in twisting is slack—especially on coarse counts. This imperfection can skyrocket any normal waste report. Incapable banders, excessive humidity, careless workers who push and poke brushes indiscriminately among the bands, are some of the instigators. It may be said that the quality of the banding, also, has a no inconsiderable part to play in the causation of slack. I'm going to ask you to put this in your notebook: "conscientious and regular testing of bands is absolutely imperative in keeping down slack."

I have reserved lap waste for the last place because

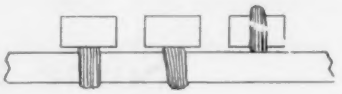


FIG. 3

it usually forms the bulk of the waste on the twisters. Many things contribute their mite toward filling the waste boxes with laps, among which are: rusty rings, poor quality yarn, excessive speed, dry rings, poor rings, dust, small bobbins at the starting of frames, and travelers too light or too heavy.

Rusty rings cause breakages when the frames are started because the rust hinders the travelers from making a quick getaway. The water used in wet twisting has a tendency to bring about an early corrosion. The latter is, no doubt, also helped along by the ingredients often found in the greases used as lubricants on this machine. The remedy is to burnish the rings. Early spring is a good time to do this work as it makes for better running conditions during the summer months.

A poor grade of yarn, made of "sweepings" as one old spinning master used to jokingly remark, will promote excessive waste. Laps, laps, everywhere, and no relief in sight, Fig. 3. An S. O. S. must needs be sent out when in

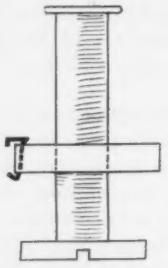


FIG. 4

such a fix. Often only a getting-together of all the overseers involved in the preparatory departments will help in this case.

Haste makes waste. You've no doubt had this old adage dinned into your ears quite frequently. So often, perhaps, that it has come to be something of a chestnut, and has lost its force as an epigram.

But, nevertheless, it still holds good in twisting. I refer directly to excessive spindle speeds. It looks very pretty on paper to have a large figured production due to high speeds; but the results in actual practice often neutralize quite sharply the best of such calculations. Understand me, I do not advise you to become antagonistic to high speeds simply because they are high. Far from it! For it is absolutely essential to efficient management that speeds as high as can be consistently used be adopted. Or to put it

in another light—the expression, "when in Rome do as the Romans do," translated into modern U. S. A. and applied to our problem means simply that if a competitor can successfully twist at a certain spindle speed, you must keep up with him or lose some of your profits. Experimentation along the lines of ascertaining proper speeds is an interesting and profitable undertaking. It will show you some solid terra firma on which to rest your feet. It would be well, however, to remember that a certain speed for one class of work may not be good for another. But before condemning the speed as the cause of excessive waste on a machine, it would be in order to go over the frame in a thoroughly analytical manner to see if some mechanical fault is not at the bottom of the trouble.

Dry rings are conducive of lap waste. Neglect in greasing is usually the main seat of this trouble. Dust blowing in at the windows is another fertile promoter of lap waste and is often confounded with dry rings, because of a similarity of soiling the yarn coincident with both of these faultmakers. Obviously, better attention to the lubrication of the rings by the operatives, or the purchasing of a better quality of grease by the firm, or a better mixing of oil and grease when such an admixture is used by the firm will help to obviate the former trouble; but it is a bit more difficult to eliminate the dust problem. Keeping windows closed entirely, relying on an internal atmosphere making apparatus may be one way of solving the problem; water or oiling the streets surrounding the mill may be another solution; while, if the plant is in the country, the raising of a lawn and quick growing trees to serve as a dust screen may also help out.

Small bobbins, i.e., partly filled bobbins, Fig. 4, at starting time, morning or noon, help to swell the total amount of lap waste, because of the greater traveler pull of the partly full bobbins and the consequent tendency of the ends to rupture under the strain of starting. As a remedy for this condition, it is advisable, whenever possible, to arrange the doffs so that the bobbins will be at least half full at stopping time. However, if this plan cannot be adhered to, the twister tenders should be drilled into the habit of going around their machines at starting time, lifting the top rolls wherever an end has broken, and in this way keep to a minimum any waste so made.

Travelers too light or too heavy cause lap waste. The former because the ends whip together, several of them consequently breaking and being carried around the bottom roller; the latter, on account of the very heavy pull, causes a rupture of the ends which then are carried around the roller. The cure, patently, is to experiment until the proper traveler is found.

The question often arises: how much waste may be considered as unavoidable at the twisters? The answer depends a good deal on the various points that I have dealt with. Nevertheless, an easy and practical guide may be had by testing a few sets of twisters. Try various counts. Then tabulate the results. It may be said that in making this test, the machines should be looked over to see that they are in good running order, and it may be further said that only the best twister tender should be selected to operate the frames.

The reason for the latter course is that because of the smaller amount of waste that the best worker will have makes the ideal of the minimum waste harder to reach; the goal is always just a little ahead of one.

Coming back to the so-called simplicity of the twister and its relation to the waste; when it is realized that by the time the yarn has been brought to that stage of manufacture where it is ready to be twisted, it has cost a considerable amount of money, it will be seen that the very simplicity which leads the mill executive to overlook the waste factor may prove a mighty costly business to the firm.

Therefore, if you want to take advantage of every opportunity that comes your way to make a success of your job, then dig, and dig deep into the twister waste.

A Trip Through the Whitin Machine Works.

This is the title of a most interesting and informative souvenir book just issued by the Whitin Machine Works, Whitinsville, Mass. Containing 55 pages, presenting largely excellent photographic views of the plant and village of the company, the book carries out the intent of its title in furnishing a comprehensive pictorial visit to Whitinsville. Some idea of the proportions of the company's properties, as presented in the book, can be gained from the facts that the Works' contain over 40 acres of floor space; have a foundry capacity of 150 tons per day; use 4,500 tons of steel and four million feet of lumber per year; and 20,000 tons of coal per year in the power house. This immense project has developed from the humble beginnings in 1831, when John C. Whitin made and patented his improved "picker."

The book presents photographs of the company officials and executives and past officials, and group pictures of the northern and southern sales forces. Interior views of the offices and various departments show forcibly the great scope of the work involved in the production of this well-known line of textile machinery. The foundry, cast iron annealing, blacksmith, stock, machine, erecting, carpenter, power, and other equipment produced by the works just pictured in such a graphic manner. An interesting sidelight on the organization is given by the "Honor Roll" page which shows that 25 employees have been continuously connected with the Works for 50 years or more; 37 for 40 to 50 years; 123 from 30 to 40 years; 76 from 25 to 30 years; 108 from 20 to 25 years; 204 from 15 to 20 years; 220 from 10 to 15 years, and 466 from 5 to 10 years.

In the last section of the book, the reader is carried through the Village of Whitinsville, which has been built up around the Works. Here is found an industrial community comparable with those modern village developments of the southern cotton mill. Around the works is the village consisting of fine homes, some privately owned, and others owned by the works. A business section has been built up, with schools and churches, streets, water works and fire departments. The tenements are rented at low rates, and are largely modernly equipped with furnaces, electric lights, toilets and baths. A large memorial gymnasium, erected in memory of George Marston Whitin, is the center of the social and recreational activities of the town. Attractive views of officials' homes, churches, the memorial gymnasium, the Blue Eagle Inn, boarding houses, and representative tenements present the various phases of the community's life in interesting form.

Mill men may secure a copy of the book upon request to the Whitin Machine Works, and would beyond doubt find it of interest. The edition is naturally limited, however, and an immediate request would be necessary.

Warp Sizing

BY PAUL SEYDEL

Flour and Starches.

Wheat flour has been until recent years one of the principal ingredients of sizing, especially in Europe where corn starch has not been used very long and especially as universally as in this country. It has decided advantages in that its penetration is good and due to its high gluten content it possesses considerable elasticity, but it mildews more readily than pure starch.

The gluten holding the starch grains in groups, it is customary, in order to obtain the best results, to separate these granules through mechanical or chemical treatment. The flour is therefore steeped in water containing zinc chloride, or else in pure water, for a period extending from a few hours to several weeks. When steeped for a prolonged period it ferments, producing acids which must be neutralized through the use of an alkali such as sodium carbonate.

Wheat flour is used mostly for grey cloth or warps to be weighted with China clay or other weighting materials as its adhesiveness is very useful for this purpose.

The Egyptians, Greeks, and Romans long ago produced wheat and barley starch. There are many ways of preparing starches. Wheat starch was prepared by fermentation or the so-called sour process, either the whole grain or the flour being steeped in cold soft water for several days, the grain being crushed after becoming sufficiently swollen and soft.

This, or the flour, receives repeated water treatments, the mass being mixed with water, allowed to rest and finally decanted; this process is repeated until the water becomes colorless. The starch finally deposits in layers of different states of purity; the gluten and albumen being on top. After the water is drained off, the different layers are removed in separate cisterns wherefrom after agitation the mass is passed through fine sieves which retain impurities. This process is repeated until a product of satisfactory quality is obtained.

The starch is finally drained and dried into a compact mass which is placed on porous bricks, to absorb as much moisture as possible, and finally further dried in ovens at low temperature requiring several days to reach its proper moisture content.

A more up-to-date method of making wheat starch is to knead wheat flour into a stiff dough with water. In about one-half hour to an hour, depending on the temperatures, the mass is sufficiently uniform for further treatment.

A stream of water is then made to run over the dough which is subjected to the action of rollers, the object being to separate the starch from the gluten, and the stream of water, through a system of sieves and troughs, finally deposits the starch upon these troughs and a suitable receiving vessel where it is allowed to settle. The water is drained off and the starch treated as described. After having received several washings and being decanted a number of times to insure the desired quality, it is carefully dried.

The manufacture of starches from other sources differs according to the nature of its origin and each material requires special treatment. Some starches need the assistance of chemical as well as mechanical agents to purify them and to isolate the starch granules from gluten and other accompanying products.

For the confectionery and laundry trade, starches have been produced which being thin boiling make possible the production of a much more concentrated paste. This paste, however, has much less viscosity, which, when good light sizing is desired, is essential; so that although, for certain purposes, a reasonably thin boiling starch may have its application, very thin boiling starch should not be used for sizing, nor should any thin boiling starch be used without some sizing compound containing an efficient agglutinant as well as an adhesive designed to overcome the lack of viscosity of the starch.

These thin boiling starches are produced through the action of a weak acid, either cold or at least at a temperature safely below that of the gelatinizing point, the effect being that the cell sacs are partly destroyed, which decreases the viscosity of the starch in proportion.

Starch is an ingredient of all vegetable growth; it serves as a reserve food for future use. It is found mostly in seeds such as cereals, in tubers such as potatoes and yams where it is intended to feed the young plant; it exists also in roots and stems such as sago and more or less in every growing part of the plant.

Starch granules are formed in the protoplasm of chlorophyl grains, the content of which as well as favorable temperature and carbon dioxide are required for their growth. The size of starch grains depend largely on their age, although the average size of starch grain from different sources is fairly constant and an expert can differentiate starches from the average size of these grains as well as from their peculiar appearance as revealed by a fairly powerful miscroscope.

When examined under a microscope of sufficient power, starch grains appear to be made up of concentric layers. The center layers are not as dense as the outer layers; the inside layers are not as old as the other ones, the growth taking place from outside inwards.

The starch grains consist of two substances besides water: Granulose and cellulose in the proportions of 95 per cent of granulose and five per cent of cellulose. The outside coating is mainly starch cellulose which protects the granules against the action of cold water, if the cellulose is broken through heating or other cause water will, through repeated treatment, remove all of the granulose. The cellulose remaining will be colored yellow by iodine, whereas the granulose is colored a deep blue.

The starches mostly used in sizing are maize or corn starch, farina or potato starch, tapioca or cassava starch, sago, wheat, and rice.

Maize or corn starch is the starch most used in this country for sizing purposes, both in its natural form and converted into so-called thin boiling starch.

The main virtues of corn starch are that its price does not fluctuate as widely as that of other starches, the supply in this country is greater and more uniform in quality, and the price is generally considerably lower than that of other starches.

It has fair adhesive and sizing qualities, its main objection being that it has a harsher feel than starches from other sources. This can, however, be overcome by the use

of a good sizing compound and to a certain extent by the admixture of other starches, especially potato.

Under the microscope corn starch is readily identified. Its grains are more even in size than the granules of starches of other origin, smaller than wheat or potato, larger than rice, their appearance is polygonal approaching a circular shape, as, due to pressure, the edges have apparently become depressed.

Farina or potato starch granules are very uneven in shape and size, but easily recognized under the microscope. Even with a naked eye, the silky appearance of the starch when pure is very characteristic. It gives a full soft feel to the cloth, and is used extensively, especially in Europe, both for sizing and finishing. In this country it is used principally for fine and colored warps; on account of its greater transparence it does not dull shades as much as some other starches do. The reason potato starch is not used more extensively is due no doubt to the fact that its price is not only higher, but that the price fluctuates much more than that of corn starch.

Tapioca starch is produced from the root of the maniot. Examined under the microscope the granules present the appearance of a cup and are readily identified by an expert. It gives a softer feel to the cloth and warp than corn starch does. It produces dextrines and gums of excellent qualities both adhesive and agglutinant.

Wheat starch granules are very uneven in size. In shape under the microscope they appear circular and flattened somewhat as a disc. It is an excellent starch and gives a smooth full feel; on account of its adhesiveness it is used as a good carrier for China clay and other weighting ingredients. Provided it is not baked too much on the slasher drum, it will not dust off as readily as most starches. The price, however, is against its use in very large quantities.

The granules of rice starch when examined under a high-powered microscope are readily identified. Pentagonal or hexogonal in form, they are the smallest of the starches used for textile sizing. It gives a very full, firm feel. Its use in stiff collars and shirt fronts has made it very popular in laundries.

The sago starch granules, although irregular in shape, show a rounded end on one side and a flattened end on the other side. Sago granules are marked in a way that make their appearance easily recognized by an expert. This starch produces a firm feeling warp. It is essential to overcome a certain harshness to boil it for a much longer period than other starches.

Air-dried starch contains nearly 20 per cent of water as an average. This can be eliminated by heating in dry air at a temperature between 100 and 105 degrees Centigrade. If this dry starch is exposed to moist air it will absorb between 20 and 35 per cent of water. Dry starch may be heated to 160 degrees C. without alteration; above this temperature it is converted into dextrine.

When heated with water the starch granules swell very greatly and at a certain temperature the cellulose coating breaks and the mass becomes viscous, producing, when in sufficient concentration, an adhesive paste.

Whereas potato starch is completely gelatinized at 65 degrees C., maize or corn starch requires 75 degrees C. and wheat and rice do not gelatinize completely until a temperature of 80 degrees C. is passed.

This refers to pure starch. Starch in impure state requires a higher temperature.

Hot water does not break all granules at once. The smaller and younger ones break first and the oldest ones are the last to break.

Potato starch, for instance, begins to thicken at 55 degrees C. and reaches its maximum viscosity at between 65 and 70 degrees C. Viscosity of the paste is due to the starch cellulose or amylopectin. Not only the origin of the starch, but the treatment the starch has received during the process of manufacture and drying, cause a very great difference in the viscosity of starch pastes. Some starches receive an alkaline treatment which greatly reduces their viscosity. Acid treatment has a similar action.

Although the point of maximum viscosity of different starches varies widely according to the nature of the the starch, the temperature and the amount of water it is heated in, prolonged heating after considerably thinning the paste, finally shows a tendency towards equalization.

Pure starches are naturally more viscous than others, potato starch, for instance, gives as thick a paste as nearly twice the amount of wheat starch.

Starch is susceptible of many transformations through the action of chemicals, it can be used for the production of a long list of very useful materials including sugar, alcohol, acetic acid, a great variety of gums, from highly soluble to quite insoluble, from highly adhesive to highly agglutinant, depending on treatment. A number of acids, alkalis, and even salts have decided and peculiar actions on starches, and it is possible to duplicate or approximate most of the natural gums used in sizing and finishing and in most cases greatly improve on such natural gums as gum tragacanth, bone glue, Irish moss, etc., because they can be made in greater concentration, at lower cost, and with more dependable qualities.

These properties of starch have been used extensively in sizing and finishing and the scientific gum and sizing manufacturers have produced very valuable starch products for textile use by the proper blending and treatment of a number of starches acted upon by a considerable number of chemicals. Keeping, of course, in mind the requirement and compatibilities essential in view of subsequent treatment of the warp and cloth as well as its storage and use.

So that gums have been produced that are not only practically colorless and odorless and have greater adhesiveness or agglutinant qualities or which are more concentrated and economical, but which withal will not be so readily attacked by micro-organisms and will not interfere with the processes of bleaching and finishing.

Science's object being always to improve upon nature just as the soda ash produced chemically is infinitely superior in quality and vastly cheaper in price than the article derived from vegetable ashes.

Every sizing and gum manufacturer with the proper facilities for research is constantly developing more, better and cheaper gums, with the object in view to add to starch both thick and thin boiling, those qualities of adhesiveness and elasticity, of which it is deficient, increasing not only the breaking strength of the warp, but most important its pliability and resistance to the mechanical wear and tear of weaving.

Besides chemicals some ferments such as diastase have been used to act on starch with more or less success. Their main objection is that they are not readily controlled. And

a good many of the by-products of their action are seriously objectionable for sizing purposes. For this reason they are used more successfully for the purpose of stripping starch from goods previous to bleaching, than for use in making thin boiling starch.

In boiling starch for sizing purposes it is not possible to say exactly what is the time required to reach maximum viscosity. This depends as much on stirring and on concentration as it does on boiling; the more vigorously the size is stirred the more rapidly the point of maximum viscosity is reached. The concentration of the solution also affects the results. A ten per cent solution may take an hour to reach its maximum viscosity whereas a one per cent solution of the same starch very vigorously stirred will reach it in a very few minutes.

Continued boiling and stirring have the effect of breaking up the cell sacs of the starch granules with the result that after the maximum viscosity is reached the solution thins down until all cell sacs are broken. When this point has been reached the starch solution does not thin down so fast unless a good deal of steam condenses. This should be avoided by the protection of the kettle with a jacket of asbestos cement. Prolonged boiling within reasonable limits is beneficial although a lowered viscosity will cause less starch to adhere to the warp.

It can be easily understood that to assure even results it is best to prepare small batches of size at frequent intervals and to boil and stir sufficiently to be sure to reach a point where the viscosity does not vary too considerably. This is generally admitted to be at least one hour in the case of thick boiling starch and considerably less for the different thin boiling starches. Keeping a batch of size any considerable period, and more especially allowing it to cool even if it is warmed up again is much more detrimental to even results than most people seem to realize. Starch kept over night is more expensive to use than it would be to throw it away. It is difficult to realize how much starch deteriorates from the standpoint of sizing. It is quite important to keep a size at high temperature until it is entirely used up, as when the temperature drops a considerable amount of starch becomes insoluble and even though the size has not been greatly reduced in strength by prolonged or renewed boiling it has lost so much of its elasticity and sizing qualities as to make it almost worthless. It is essential to keep size at a high temperature, remembering, however, that after the maximum viscosity has been reached violent boiling increases fluidity. It is sufficient to maintain a gentle boil so that the whole mass of size will be as near the boiling point as practical.

The main objection to a steam jacketed size box or steam jacketed size kettle is that when stirring is not vigorous and efficient it is impossible to avoid scales by overbaking of starch. This of course is very undesirable. A good dry, live steam with proper precautions against excessive condensation is best for this reason. It is generally conceded that it is better to use a more concentrated size at 200 to 205 degrees F. than to use a less concentrated size with the same viscosity at about 170 degrees F.

An efficient system of temperature control is useful in helping to obtain uniform results.

After very close study and investigation of the subject of penetration, and after many experiments, the writer is convinced that considerable penetration does not occur with a good viscous size to any considerable extent. A size sufficiently thin to penetrate very far between the fibers of the yarn, would lack in sizing qualities. The size must cement loose fibers, it must protect the warp, and for this reason it is most essential that besides good lubricating qualities it must have proper adhesiveness and agglutinant virtues.

The size on the outside is better than inside; it has more elasticity and more resistance, just like a pneumatic tire is better than a solid tire for speed and good running work. Of course it must stay there and on the proper ingredients of the sizing compound we must rely on keeping the starch where it should be. The fatty ingredients in a sizing compound have a tendency to reduce the rate of congealing of the starch with the result that the size will remain fluid through the squeeze rolls and until its water contents is evaporated on the slasher drum.

[This is the second of a series of articles on "Warp Sizing" by Mr. Seydel. The third article will discuss "Gums and Glues."—The Editors.]

Towels and Toweling

BY T. WOODHOUSE AND A. BRAND.

Jacquard Stripes.

An important class of striped toweling fabrics is that in which the body of the fabric is developed in some simple weave and produced with the aid of simple forms of shedding mechanism such as tappet or dobby, while the stripe proper is of a comparatively elaborate nature requiring the use of a small jacquard.

The characteristic feature of the stripe is that it is usually—but not invariably—developed in contrasting sateen weaves on the damask principle, producing a special design in the nature of a trade-mark, a monogram, the name of a firm, public building or institution, and the like.

Self colors—grey or white—are occasionally used but, in general, colored yarns are introduced into the warp for the lettering and for figures in order that these parts may contrast effectively with the ordinary warp which is, as already indicated, some kind of grey or bleached yarn. Checked effects are also produced by the corresponding use of suitably colored filling. Such toweling fabrics are much used by railway and steamship companies, large employers of labor, hotels, public offices of all kinds, as well as for domestic fabrics distinguished by a large variety of names; e.g., kitchen cloth, glass cloth, tea cloth, etc. The design embodied in the stripe serves one or other of a number of purposes; thus, it may act as a deterrent to theft, a means of identification, a medium of advertisement, etc.

A photograph of a cutting from a typical example of this class of toweling is reproduced in Fig. 103. The original is an excellent fabric, and is made from flax yarns throughout, with the exception of the warp for the special stripe, which is of 2-fold Turkey red cotton. The warp of the body of the cloth is of boiled flax line about 30 leas of 300 yards each per pound, while the filling is of flax tow, about 25 leas per pound.

One of the reasons for the excellence of this fabric is that the warp in the body of the fabric is double, i.e., each mail of the harness controls two threads which thus work

together as one thread throughout the fabric. There are 36 double warp threads (or 72 single threads) per inch, while the filling is inserted at the rate of 40 picks or shots per inch. The special stripe contains exactly 100 threads of warp and is fully 1½ inches wide, so that the stripe contains about 67 threads per inch, and has evidently been

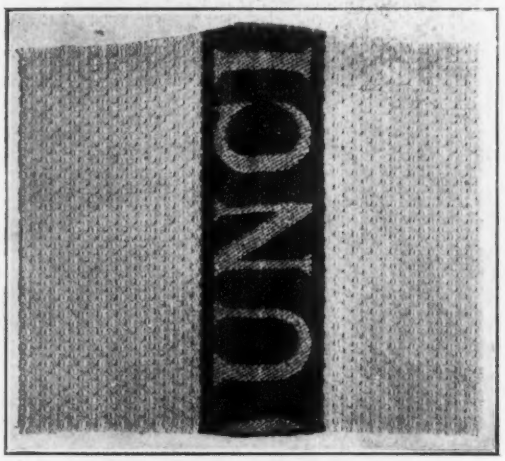


Fig. 103.

crammed in the reed in the proportion of two to one.

The ground of the fabric is produced in the well-known 10-thread huckaback, already dealt with in Figs. 64 and 65, and in the accompanying text. See COTTON for September and October, 1924. Four repeats or units of the design are reproduced at C, Fig. 104, for ready reference. This design is marked as for single warp, but the fabric under discussion is double warp so that the design is more correctly shown by D in the same figure, where single threads are individually marked, and where two repeats in the way of the filling are shown, but only one unit in the way of the warp threads.

The lettering in the stripe—evidently part of the word COUNCIL—is developed by the weft flush form of the 5-thread sateen weave, four repeats of which are indicated at E in Fig. 104. The ground of the special stripe is developed by the warp-flush form of the same sateen weave, four repeats of which are shown at F in the same figure. The forms of the 5-thread sateen weaves shown in this figure are those invariably adopted for figure work of all kinds. It will be noticed that the stitching or binding points in the weft-flush weave E, Fig. 104, "twill" or move diagonally in a direction exactly opposite to those in the warp-flush weave F, Fig. 104. This is purposely arranged in order to secure a maximum number of "cutting" points at all threads and picks which form the boundary lines of the figure.

Probably a positive tappet loom would be used to most advantage for the production of the ground section of this fabric, with the aid of a 100s jacquard to control the cotton warp threads of the special stripe. The original designer of this stripe probably fixed the number of threads in the stripe at 100, because he had the use of a 100s jacquard, and similarly he would choose the 5-thread sateen weaves because 100 is a multiple of 5. This latter course is particularly advantageous where there are figure bounding lines at right angles to either warp or filling, an occurrence which is comparatively common in lettered goods.

A small portion of the stripe design, embracing 96

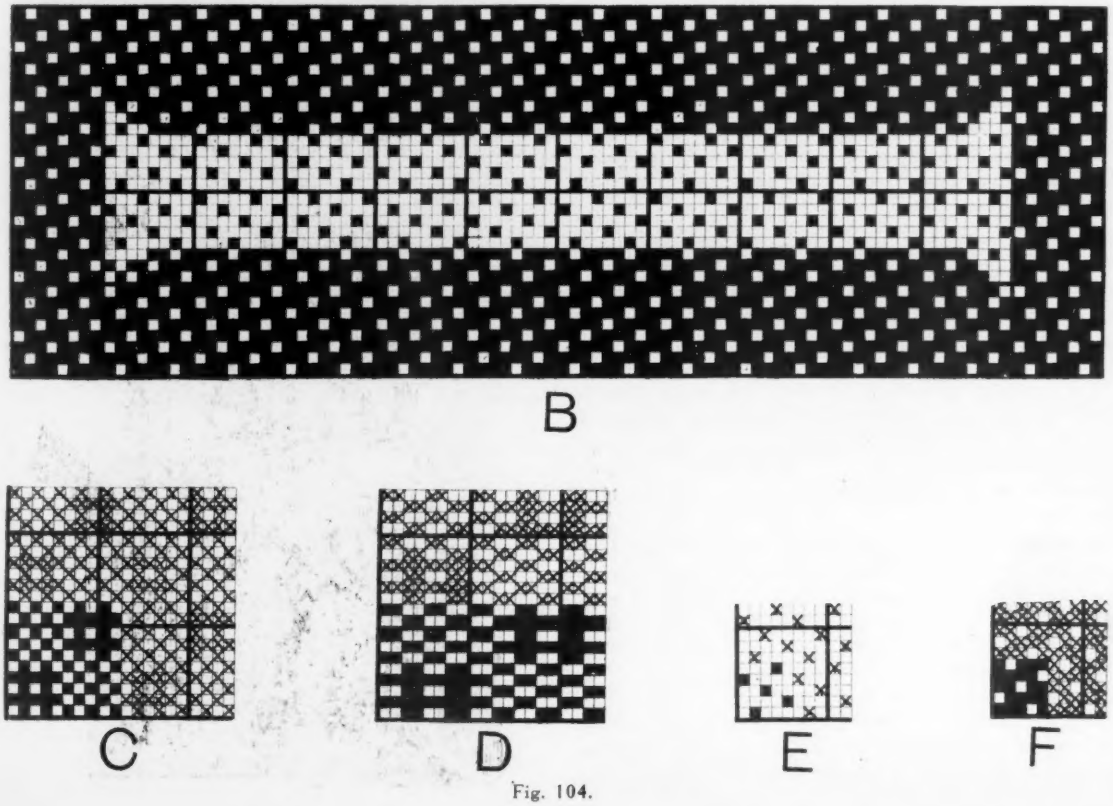


Fig. 104.

threads and 32 picks, and showing the development of the letter I, is reproduced at B, Fig. 104. It will be seen that the threads and picks which form the boundary line of ground and figure "cut" perfectly where the boundary lines are vertical or horizontal. Towards the ends of the letter, at the curved parts, examination will show that it has been necessary to insert marks in the weft-flush (or figure) portion, and to delete marks in the warp-flush (or ground) portion, in order to preserve, as far as possible, a distinct outline for the complete letter.

The use of red warp and white filling, with the weaves described, results in the production of white letters on a red ground provided that the cloth were woven face side uppermost. In general, however, such fabrics are woven face downwards, and consequently, the ground weave B would then be read as "marks to fall" instead of "marks to rise." In addition, the figured or lettered design B would have to be read the same way. A rather different, and more simple method, however, is practiced in the making of the figured portion. These parts of the design are invariably painted in solid red masses, or in other suitable color, and then either black, white, or other different color from red is used to insert the weaves. Afterwards the ground weave is inserted in red, the same precaution being taken to make all parts cut if possible. The card cutter then cuts all red marks and leaves uncut every other color.

The design in Fig. 105 is a typical example of those which are prepared for so-called "lettered" goods; it was indeed prepared for use in a factory, and, although straight twills appear in the ground portion, and a sateen weave in the figure portion, the arrangement is similar to that indicated. There are, however, faulty places in the design.

The process of shortening or lengthening floats of warp or filling in order to preserve the desired contour of the figure, is only possible where full-harness jacquards are used. It is not possible with twilling jacquards, where the stitching points are determined by special mechanism and cannot be controlled by the designer. Such jacquards, however, are seldom, if ever, used in the production of this particular class of fabric, although letters and numbers, which form part of more comprehensive designs, are often woven by means of these twilling jacquards.

Where linen and cotton warps are used together in the same warp, trouble is sometimes caused by distortion of the filling. This is due to the difference in the uptake of the two warps, and is exemplified by the curvature of the upper edge of the sample illustrated in Fig. 103, the pattern of which was carefully cut to follow one pick of filling. The curvature may be the other way, i.e., concave instead of convex; the particular line followed depends partly upon the relative interweaving values of the ground and figure threads, partly upon the thickness and setting of the two kinds and partly upon the fiber from which the yarns have been made. Generally speaking, the cotton yarn is more flexible and more easily compressed than the linen yarn, and, to insure equality in uptake, it is advisable that the cotton yarn be correspondingly heavier in count where other things are equal, or more closely set, or both. When different weaves have to be used for the body of the cloth, and the stripe section remains constant, the best plan is to beam the cotton stripe threads on to a special beam, and tension it accordingly. This method is probably the best in all cases, for, in addition to the possibility of tempering the tension as desired, blue, red, white or other

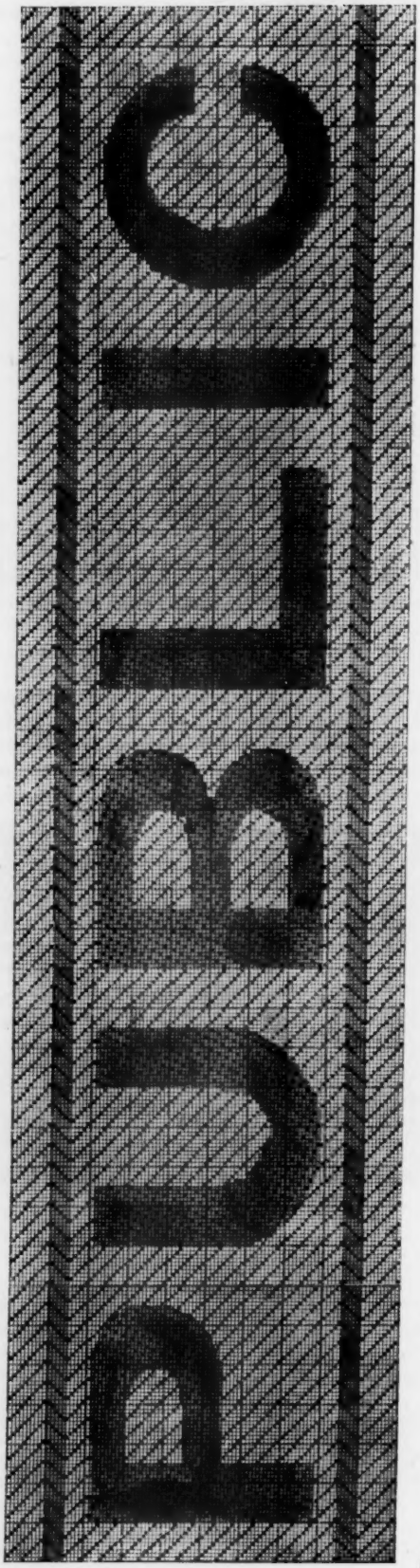


Fig. 105.

colored stripes can be introduced if and when desired.

In the example illustrated in Fig. 103, the cotton warp is evidently resisting compression more than the linen warp, from which it may be deduced that a slightly higher and finer count of cotton yarn should have been used for the stripe.

A somewhat similar type of embellishment commonly used in toweling fabrics is illustrated by the reproduction in Fig. 106. It differs from the sample in Fig. 103 mainly in the employment of a more elaborate color arrangement, and in the use of a conventional design in place of the lettering. The symbolic ornament suggests that it is the "end piece" which accompanies the wording "stable rubber," the latter appearing in letters between two such ornamental end pieces, and the whole developed in two contrasting weaves, and generally in two contrasting colors as already described and illustrated.

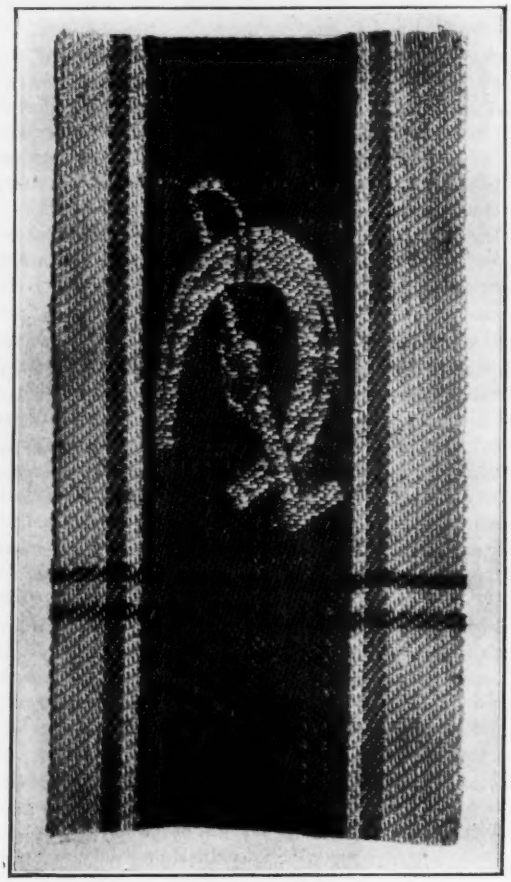


Fig. 106.

In the particular cloth illustrated in Fig. 106, the ground of the fabric is developed in the well known 2 up 2 down serge or cassimere twill, full particulars of which have already been given in connection with Figs. 9 to 12, see COTTON for November, 1923. The cloth is woven from flax tow warp and filling, the count of both of which is about 20 leas per pound, and there are 38 threads per inch of warp and 40 picks per inch of filling. The colored threads, both warp and filling, are of 2-fold cotton, and are "crammed" in the proportion of two to one. Thus, there are 100 threads in the central main stripe, which is about 1 7/16 inch wide, giving a setting of the colored warp of approximately 76 threads per inch.

The order of coloring in the stripe portion only of the cloth is as follows:

Indigo (2-fold cotton)	8	8 =	16
Natural (single flax tow)	4	4 =	8
Turkey red (2-fold cotton)	100	=	100
			124

The outer stripes of 8 blue threads are approximately equal in width to the inner stripes of 4 natural-colored threads, so that here also the colored threads are crammed in the proportion of 2 to 1. The width of the complete stripe over the outer blue threads is 2 inches.

The design is a conventional arrangement of horse-shoe and hunting-crop, and is developed by the 5-thread warp-flush and weft-flush sateen weaves, giving the design in white (or natural) on a red ground. The main red stripe is accentuated and defined by the subsidiary blue stripes, and further decorative effect is introduced by means of indigo and Turkey red 2-fold cotton filling, similar in all respects to the colored warp threads. The order of inserting the colored filling is as follows:

Turkey red 2-fold cotton)	6 picks
Natural (single flax tow)	6 picks
Indigo (2-fold cotton)	6 picks
Natural (single flax tow), the number necessary to complete the length up to the next cross border stripe.	

The 5-thread sateen weaves are identical with E and F in Fig. 4, and need not be further discussed at this stage. The loom required to produce this fabric would be an ordinary negative tappet loom, provided with a 100s jacquard to control the 100 red threads for the central part of the stripe. Although there are three colors of weft used, it is unlikely that a multiple box motion would be employed in such a case; the chances are that the weaver would change the shuttles by hand for the cross-border in order to make the cloth the correct length.

(To be continued.)

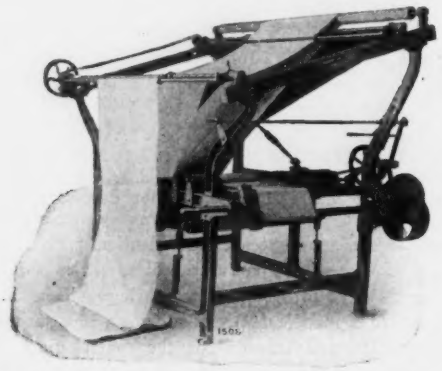
Of especial interest to mills using fine single and two-ply cotton yarns for filling, in either silk or worsted fabrics, is the announcement that the Providence plant of the Franklin Process Company has recently installed some No. 90 Universal winders, which enables them to deliver yarn to mills on paper cops. It is pointed out that since Universal wound cops contain from 50 to 75 per cent more yarn than ordinary bobbins, the doffing time is reduced in proportion. The sizes of cops being furnished regularly at the present time are as follows: 6½-inch cop with 6-inch traverse and 1 3/16-inch diameter; 8-inch cop with 7⅝-inch traverse and 1 3/16-inch diameter; and 8½-inch cop with 7¾-inch traverse and 1¼- to 1 3/16-inch diameter.

National Aniline & Chemical Co., Inc., 40 Rector St., New York City, has just issued a new shade card entitled, "Direct Dyes for Cotton," showing an important series of 98 colorings on cotton yarn. Besides the dyeings, which are shown in two shades, the book includes full technical directions for the use of the individual dyes, covering 20 pages of text matter. There is also included an elaborate set of tables giving the fastness properties of each dye, to enable the dyer to make his selections to meet every condition presented in the dyehouse. The volume is substantially bound and should be an important addition to the working library of the cotton dyehouse.

A Cloth Doubling Machine.

A cloth doubling or rigging machine, that is especially adapted for silk, artificial silk and other fine goods, is being produced by Robert Hall & Sons, Bury, Ltd., Hope Foundry, Bury, England. As indicated by the name, the machine is designed for the purpose of doubling or creasing the cloth lengthways down the center—known sometimes as "rigging." A view of the machine is shown in the accompanying illustration.

The cloth can be drawn from rolls or from loose folds, and can be either rolled up on sticks or boards, or made into oval rolls by means of expanding swords. When the machine is arranged to work from rolls, a centering motion is applied to eliminate any tendency for the cloth to "cockle." The machine in the illustration is arranged to



double or fold cloth and to coil it up on expanding swords. For special purposes, it is sometimes necessary to lay the doubled cloth down in folds, a suitable arrangement being provided for this purpose.

A measuring motion, with a large measuring roller and dial, is supplied, suitable for measuring in yards, meters or other unit of measurement. Two pairs of cloth guides with screw arrangement for quick adjustment are provided, being fitted for keeping the goods always in the center hand wheel.

The "V" table for doubling the cloth is made of well-seasoned polished timber, it is stated, and has a correctly fitted point.

While especially suitable for silk and artificial silk goods, it is stated that the machine may be arranged for practically any fabric, including heavy woolen and cotton goods. The concern also produces a plaiting machine with special details for silk goods to work in combination with the machine when the goods are to be plaited, cuttled or folded.

Barber-Colman Company of Massachusetts, have announced a change of address from Boston to their new offices at Framingham, Mass. W. B. Anderson, who for years has been in charge of the Barber-Colman Company's Boston office, is manager of the Framingham office.

Toledo Scale Company, Toledo, Ohio, has issued an interesting little booklet entitled "The Measurement of Materials." The elimination, through accurate mechanical weighing of otherwise mysterious manufacturing losses, discrepancies, etc., is discussed.

Re-Organization of Frank Mossberg Co.

The Frank Mossberg Company has been re-organized with new working capital, new officers and directors, under the name of Frank Mossberg Corporation. The address remains as Lamb Street, Attleboro, Mass. Lewis R. Smith is president and general manager of the re-organized company, and A. A. Underwood is secretary and treasurer. Mr. Underwood is one of the pioneers in introducing pressed steel beam heads in the textile mills, and is well known among the mills in the South as well as other sections. The company is a well known designer and maker of pressed steel loom beam heads, section and adjustable heads for the textile industry and steel spools and reels for the wire and cable industry. For over 20 years it has manufactured wrenches and socket sets for the automotive industry.

In addition to these lines, the company also does a very extensive business in special steel stampings of all descriptions. Pending the re-organization, the company engineers have been working out many new and improved features in the construction of its textile and wire mill products and the new designs, it is announced, are now ready and many in actual use in the mills.

The financial statement after the re-organization shows current assets approximately $220,000 in excess of current liabilities.

A new method of coning rayon has been patented by The Malina Company, 6 West 18th St., New York City, which is designed to eliminate the difficulty caused by knots that has been a great source of worry to knitters using rayon. Where no disposition is made of the knots in the yarn, and they remain on the outside of the cone, the yarn breaks, causing press-offs or flashes or mis-plaiting, it is explained.

The idea patented by the Malina company is, in winding the rayon, to form a groove in the yarn as it is wound, about an inch from the top of the cone, and all of the knots made in the yarn during the course of winding are placed in this groove by the operator of the machine. Thus, it is explained, the thread cannot catch on any knots in the cone, as these knots are within the groove below the general surface of the cone. Malina cones, it is stated, have been thoroughly tested in use in mills. The groove is not placed in the paste-board cone, the regular shape of cone being used, but is formed in the yarn itself in the process of winding. The Malina company are not winders of yarns, but sell their own rayon yarns natural or dyed put up on the patented groove cones.

To mark the centenary of their business, covering the period 1823-1923, Wilson Brothers Bobbin Co., Ltd., Garston, Liverpool, England, have prepared a brochure setting forth the history of the concern from its establishment in 1823 by the late Lawrence Wilson. The booklet is most elaborate and attractive, containing 78 pages. It is handsomely prepared, the illustrations being in sepia. Contrasting views of the original plant and of the present extensive works are included. An interesting aerial view of the Cornholme Works, which, it is explained, are the largest bobbin and shuttle works in the world, employing 1,400 people and covering 11½ acres, as well as other illustrations of the various departments of the business convey an idea of its proportions and the extent of its activity, is shown.

Humidity in the Cotton Mills

BY F. J. HOXIE.

Humidity is an important factor in every department of the cotton factory from the cotton storehouse to the finished goods storehouse. In the storehouses in which cotton or goods are kept which are bought and sold by the pound, it has a direct m oney value, as a variation in weight of 10 per cent is possible under extreme conditions, and this 10 per cent will appear as dollars and cents in buying and selling cotton and cotton goods under widely varying humidity conditions.

The amount of water being bought with the cotton can be indicated with commercial accuracy by placing a recording hygrometer in the storehouse and unfavorable conditions as shown by the indications of this instrument can be corrected by applying heat and ventilation to the storehouse when conditions are too moist, and artificial humidity when they are too dry.

The main object of this discussion is to consider the bearing of humidiy on the operation of the manufacturing processes rather than its weighting effect on the material. Humidity acts on cotton in two ways. When a considerable amount of moisture has been absorbed by the fiber it swells and becomes very soft with little tendency for one fiber to cling to its neighbor, whereas when the cotton is very dry, it takes a charge of static electricity which causes the fibers to repel each other, making fuzzy yarn. Either extreme is disastrous to efficient carding or spinning. This is particularly marked where the cotton sliver has little twist and has to depend largely upon the fibers clinging together to prevent the ends from breaking down, as in the drawing and the mule spinning. There are two forms of humidity that affect these conditions, that is, absolute humidity which is the number of grains of moisture contained in a cubic foot of space, which is important in controlling the charge of static electricity on the fiber. The relative humidity is the percentage which the moisture contained in a cubic foot of space bears to the amount which would be necessary to completely fill or saturate this space. For example, a cubic foot of space at 70 degrees F. can contain eight grains of moisture when completely saturated. If a cubic foot of space contained four grains of moisture at 70 degrees F., it would have a relative humidity of 50 per cent and if it contained two grains of moisture, it would have a relative humidity of 25 per cent.

In the mule spinning department, both relative and absolute humidity are important. The cotton absorbs moisture in direct proportion to the relative humidity. If the relative humidity is too high, it will absorb a large amount of moisture and become very soft and limp and will not hold together before the twist is put in. If, on the other hand, the absolute humidity is too low, it will hold a charge of static electricity which will cause the fibers to repel each other ,causing fuzzy yarn. From this it will be seen that to get advantageous results from mule spinning, it will be necessary to run a high temperature at which a high absolute and low relative are possible at the same time. For example, with the mule room at 90 degrees and a relative humidity of 50 per cent, the air will contain 7.4 grains of moisture. If the temperature of this room is decreased to 70 degrees, the air will contain only 4.7 grains of moisture at 50 per cent relative humidity, but if the amount of absolute humidity in the room is kept constant and the temperature reduced to 70 degrees, the relaive humidity will be 93 per cent, at which humidity the cotton will absorb about 14 per cent of water and become inoperative.

The beneficial effect of artificial humidity was first recognized in the weaving department in which the humidity absorbed by the warp yarn and size increases the stretch and decreases the brittleness of the same with the operation of the loom. In order to somewhat compensate for unfavorable humidity conditions, water attractors are sometimes put into the warp size. These are of varying properties. Some having a considerably higher attraction of moisture than the cotton can reduce the moisture in the cotton, but they may at the same time be efficient in attracting it to the size and causing it to have the same stretch as the cotton yarn which it surrounds. Other water attractors can cause the cotton itself to take up more water and become much more elastic or viscous.

The question which generally presents itself in the practical operation of the mill is how much humidity is necessary for the best results of the operation in a given department. This question is somewhat dependent on the local conditions of the mill and the form of cotton being used. If it is the weaving that is in question the warp size is also a factor. The most practical way of answering this that I know of is to hang a recording hygrometer in the department under consderation and to open the door of this instrument and mark on the dial when the work is running particularly good or particularly bad. After this has been kept up for s ome weeks, exact knowledge will be had as to the most favorable humidity conditions at which the department in question should be operated.—Abstracted from an address by Mr. Hoxie before the Pawtuxet Valley Textile Association.

The 22nd annual Knitting Arts Exhibition which will be held in connection with the annual meeting of the National Association of Hosiery & Underwear Manufacturers, at Commercial Museum, Philadelphia, Pa., from March 22 to March 26, inclusive, will be different from its successful predecessors in that it will be larger in size and in the number of its exhibitors and will be broader in its influence, it is announced. Chester I. Campbell, of Boston, who, for the past four years, has been conspicuously successful as general manager of this exhibition, has prepared several new features for the coming show that will add much to its value. A substantial increase in floor space that will be occupied by the exhibitors had been contracted for and laid out into booths.

Carrier Engineering Corporation, 750 Frelinghuysen Ave., Newark, N. J., which has long specialized in the field of air conditioning engineering, has recently acquired all of the capital stock of the Atmospheric Conditioning Corporation of Philadelphia, Pa. The entire air conditioning business of the latter company will be continued by the Carrier organization, while its air washer business has been purchased by Strandwitch & Scott, Inc.

What the Southern Mills are Doing

A number of important announcements regarding the organization and construction of new textile plants for the southern territory featured the opening month of the new year. Two for Georgia, one for South Carolina, and two for North Carolina, were reported to be either in process of organization or at a further stage of development.

In Georgia, a new mill to cost approximately $1,000,000, will be erected at Newnan, it is understood. A. W. Arnall, of the Arnall Mills, at Sargent, Ga., is reported to be interested and in charge of the plans. The Newnan Bank and Trust Company has charge of the stock sale. According to the report, $300,000 was subscribed by Newnan citizens at the initial meeting of organization.

Woodbury, Ga., also is to have a million-dollar cotton mill. John A. Baugh, Jr., at present agent of the New England Southern Mills, LaGrange and Hogansville, Ga., will, it is understood, be in charge of the plant when erected. The mayor of Woodbury, A. D. Jones, and J. L. Betts, R. J. Powell, S. P. Wilburn, and others, are interested in the project. A site a short distance from Woodstock, and about fifty miles from Columbus, has been selected, and construction will begin about March 1st, according to the present plans. Electric power will be used.

Definite announcement of a 50,000-spindle addition has been made by the Cannon Manufacturing Company, Kannapolis, N. C. The plant will be built on the Kannapolis-Salisbury highway, a short distance north of present Mill No. 6. The building will be 600 feet long, 100 feet wide, and three stories high, and carding and spinning will be installed.

At Newton, N. C., a fine goods mill is to be built by the recently organized Warlick Manufacturing Company. The capital is $200,000. Fabrics including silk and rayon will be produced. D. A. Warlick, Jr., Joseph Warlick, Mrs. Kate Cilley, and others, are interested. D. A. Warlick, Sr., is secretary of the Falls Mfg. Co., Granite Falls Mfg. Co., and Southern Mfg. Company, all of Granite Falls, N. C.

Following closely the acquisition of the Brogon Mills by the Appleton Company, it is announced that James P. Gossett and others, former owners of the Brogon, will erect a $200,000 spindle mill for the manufacture of Lad-Lassie cloth. It is understood that an initial installation of 300 looms will be made, with operations to begin some time this year. This mill is an extension of the Riverside and Toxaway properties, and will be located east of the Toxaway plant. J. P. Gossett, B. B. Gossett, S. H. Lander and E. P. Cofield were the applicants for the charter. Mr. Lander has been made president, and Mr. Cofield will be vice-president and general manager.

Indefinite report is to the effect that Sauquoit Spinning Company, Capron, N. Y., near Utica, will remove its 30,000-spindle combed yarn mill to a site in Gadsden, Ala., and that 20s combed yarns will be manufactured.

Another report states that the Utica Steam and Mohawk Valley Cotton Mills, Utica, N. Y., has appointed a committee to select a southern site for its first southern branch. It is understood that a location in Alabama is being considered.

Monticello Cotton Mill, Monticello, Arkansas, has been merged with the Monticello Cotton Mills Company, organized to take over, enlarge and operate the Monticello mill. H. L. Remmel, H. C. Couch, C. S. McCain, Jo Nichol, B. S. Atkinson, J. S. Mansfield, W. R. Ribenack, Gordon H. Campbell, J. G. Williamson, J. F. Boyle, C. H. Moses and others compose the company. The new company proposes to construct additional buildings, install new equipment and make other improvements, including electrification of the plant. Stockholders of the old organization receive for their holdings securities of the new company, and several remain as members of the board of directors.

J. G. Williamson will continue as president. Jo Nichol will be vice-president. C. T. Harris will continue in active charge of the mills. The new company plans to add immediately 4,500 spindles, making a total equipment of 12,000 spindles, and to electrify the entire plant, which has been operated by steam. Electric power will be obtained from the Arkansas Light and Power Company system, receiving power from the Remmel hydro-electric station, the Sterlington gas station, and other large electric power stations. Lockwood, Greene & Company are the engineers.

Nokomis Cotton Mills, Lexington, N. C., has been purchased by the Langerre Sales Company, of New York, and Joe M. Gamewell, general manager of the Erlanger Cotton Mills Company of Lexington, has been elected president.

North State Cotton Mill Company, Taylorsville, N. C., has installed a steam unit as an auxiliary to the water turbine unit.

Stonecutter Mills, Spindale, N. C., have placed order with G. G. Slaughter, of Charlotte, for rayon winding equipment, the equipment being furnished by the Sipp Machine Company, Paterson, N. J.

Contract for an extension, 100x45 feet, one-story, has been let by the Pennsylvania Yarn Mills, Central Falls, N. C. The structure will be of brick and steel, with steel sash and Barrett roof, and electrically-driven cards will be installed.

Harriet Cotton Mills, Henderson, N. C., have installed the Whitin opening system in their plants. The equipment of Universal winders at Mill No. 3 is being doubled, it is reported.

Somerset Mills, Roxboro, N. C., have let contract for a mill building, 150x100 feet, in which 60 looms will be installed as initial equipment.

It is reported that 25 additional houses for operatives will be erected immediately by the Orr Cotton Mills, Anderson, S. C.

Contract has been awarded by Joanna Cotton Mills, Goldville, S. C., for the erection of 50 additional homes for operatives.

A new cloth room structure, 70 x 100 feet, is being built by the Arkwright Mills, Spartanburg, S. C. This Company is spending approximately $200,000 in improvements. Installation of 500 new Hopedale looms to replace older models, is being made; of these 100 will be located on the ground floor and driven by Westinghouse individual motors. A complete new lighting system is being installed in the mill and also in the village by Huntington & Guerry. Lockwood, Greene & Company are the engineers on the development work.

Berthadale Mills, McComb, Miss., are to add 20 new

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looms in an extension which will be built. Twenty homes for operatives will also be added to the village. Rayon fabrics are being manufactured.

Wayne Cotton Mills, Inc., has taken over the property of the Cardinal Mills, at West Point, Miss. Julius Bayer, of New York, C. E. Wilkins, of Goldsboro, N. C., former principal owners, and others compose the new organization.

Drayton Mills, Drayton, S. C., have purchased a silk slasher, manufactured by Charles B. Johnson, Paterson, N. J., for whom Gibbons G. Slaughter, Charlotte, N. C., is southern agent.

Belton Mills, Belton, S. C., will erect a two-story power plant, 41 x 44 feet, of concrete, steel and brick construction, to generate 2,500-kw. J. E. Sirrine & Company, Greenville, S. C., are the engineers.

The New England Mill Situation.

Methods of merchandising their product are taking up as much time among New England manufacturers as methods of producing. Selling agencies are adopting new plans for popularizing old standard cotton products by window displays. The old commission house of Bliss, Fabyan & Co. has inaugurated a policy of perfecting retail displays through the assistance of wholesalers, thus emphasizing the necessity of maintaining the latter in their present functions as distributors.

This house handles such staples as Pepperell sheetings, Bates bedspreads, Laconia flannels, Otis underwear, etc. Lawrence & Co. have been holding conferences with selling forces and mill officials looking toward putting into effect new methods whereby novelty and fancy fabrics will be delivered and sold more promptly so that maximum mill output may be maintained.

Amory, Browne & Co. have made further developments in their handling of ginghams and yarn dyed specialties, as well as many of the dress fabrics they now carry. Other large commission houses are working out plans for advertising nationally, or working through wholesalers to circumvent the trend toward stifling cottons in department stores or making them the chief low sales products of many of the chain store and catalogue houses.

Tire fabric manufacturers and automobile manufacturers who buy and ship large quantities of materials have been appealing to the rate committees of railroads for a preferential rate on cotton goods shipped in carload lots. This has led to the strongest united protest ever made on such a topic by cotton manufacturers, represented through all their various associations. Small lot case shipment has become a necessity of the industry because of changed methods of buying by wholesalers and retailers, and a change of the cotton goods classification by railroad freight agents would greatly enhance the cost of shipping.

Several of the Fall River and New Bedford mills that have sold largely through brokers are now adopting plans for selling through agents in New York and others are contemplating plans of establishing agencies for the handling of combined mill products. This has come about largely through the increased service being given to southern gray goods mills by their various selling agencies in the New York markets, some of which have greatly expanded their selling plans and methods in the past two or three years.

The radical changes that have been going on in the character of New England mill products continue to attract much attention. The mills are getting away from mass production and specializing more on novelties, fancies, or mixed materials. Several of the larger and older mills are putting in jacquard and dobby looms of new construction, and depending less upon the plain automatic looms. Electrical power equipment is being increased steadily and it is now no uncommon thing to find that some mills are running whole departments day and night to meet the needs for special cloths that can only be made in the quantities wanted on certain parts of the available equipment.

Power development in New England is being expanded steadily and very recently plans were formulated for the combination of several of the largest power units covering the whole of New York State and the whole of New England. It is planned to secure power from the abnormal tides of the Bay of Fundy and the potential water powers of northern Maine and New Hampshire as well as parts of Canada. Aside from a distinct lowering of the New England coal bill, there is in sight the probability of a sub-division of operations in established mills that will make for greater economy and prompter deliveries in handling styled products. It is now stated that many of the plans afoot will not be consummated for five years but their probability has already stimulated new interest in New England textile investments.

While there is a great deal of experimental production underway in New England mills, in which rayon, silk and worsted yarns figure as possible mixtures, there is a very strong undercurrent of feeling that cotton goods products will continue to make up the great bulk of the most profitable output. Many New England manufacturers do not subscribe to the idea that cottons are to be displaced by any chemical fiber yet within the realm of possibility, although they are quite ready and willing to go on trying them out as rapidly as the consumer will take them. There is a very strong opinion expressed that while cloths of the gingham, percale, bleached cotton, and other types, have been temporarily submerged in consumer favor by many goods of a more stylish but less serviceable and a less economical character, the time is at hand with lower cost cotton and much better finishing processes available, when the demand will turn to the newly styled and newly displayed products of America's greatest fiber.

It is stated to be of much significance that mills and converters are again going to be able to offer quality cotton goods at prices that will make them attractive, if the values are properly displayed. Recently, the Amoskeag Company decided to meet competition on staple ginghams, cutting the price to nine cents a yard, the basis that had been made by leading southern producers. Interest in the goods developed at once all over the country. Amoskeag staple tickings were also reduced to the market level and mattress and other manufacturers immediately began to show renewed interest in the cloths.

A somewhat similar development was noted in some of the cotton trouserings and work cloths that have gone very slowly in recent years of high priced cotton. The ability of sheet and pillow tubing manufacturers to hold prices down has assisted more than any other factor in keeping these mills fully employed to meet an enlarged consumer demand.

It is pointed out that large corporation printers and

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finishers have not been flushed into featuring rayon mixtures as against cotton foundation cloths. They have been able to make such attractive offerings in new designs, finishes, and colorings, that distribution has been maintained on a large scale and they have been able to offer a mass output well under 50 cents a yard at wholesale. Ultimately, they believe that consumers will come back to the raw material that is lowest in price and gives the most economical service, while meeting the most advanced ideas of style. Some of the most expert cutters of cloths have been fighting shy of using mixtures for their garments intended for mass consumption as they have found that the machine processes disclose many weaknesses in the fabrics that are certain to appear to consumers in wear.

New England manufacturers have always been able to adjust to the use of low grade cotton in years of defective crops and this year is no different from others where premium prices have prevailed on the choice white staples. They are still constantly agitating with cotton buyers to encourage the growth of better staples on the plea that it it costs but little more to use good seed and cultivate carefully. The very wide use of rayon in New England mills now is generally explained as a case of meeting a market demand that will not last, and not a case of finding cottons unsatisfactory for the long pull of business.

The dullest part of the business is still in the gingham division. An analysis of the whole situation recently made by some leaders of gingham production was made and the conclusion was drawn that by the latter part of this year there will be a definite return of consumer demand for the most serviceable low priced cotton goods that can be made. Gingham output was greatly overdone two or three years ago and much injury was caused to the fabric by the poor quality of many imported lines that were not even reasonably fast in color.

The gingham mills that have been specializing in fancies in dobby, leno, and other fine dress gingham effects have been doing business steadily, but of necessity the cost of many of these cloths has been above the parity of some of the popular rayon mixtures. A change in that situation is at hand. The demand for fine checks in both fine and coarse yarn ginghams is already noted by several manufacturers and they consider that, coupled with the cleaning up of many stocks, it is the beginning of definite improvement.

Financial reports of New Bedford and Fall River mills issued at the end of the year indicated better conditions than in the year previous although there are still many Fall River plants that are passing dividends. They have been running more fully, and in a number of instances electrical equipment is being used to run parts of plants until orders may be had in quantities that will warrant further resumption of a full output. Fall River has taken in more cotton in the past three months than at any time in two or three years, showing that with their other troubles high priced cotton was their real bugbear.

Finishers have not been fully busy in the jobbing end of the business, but since the turn of the year improvement has started. Converters and others were uncertain as to styles and colorings and would not put goods in work until consumer demand set in.

The machine shops making cotton machinery are still running from 50 to 60 per cent capacity on a full time basis but have recently been doing better on specialty work in the way of renovations and renewals. Some of the loom manufacturers are overrun with business on machinery for special weaving. Some few of the companies are undertaking the production of specialties for rayon handling but have not yet gone very fully into the production of rayon machinery for the production of the fiber.

Cotton Comment.

BY H. AND B. BEER

New Orleans, January 16th, 1926.

In our December review, which was our annual review of the cotton situation, we, after having made a careful survey of the situation at that time, stated in conclusion that we were disposed to entertain a favorable opinion of the market, and favored buying, especially on depressions, while many people were pessimistic as to the future because of this season's large American crop and prospects for large foreign cotton crops. Our conclusions were founded on the belief that all known bearish features were about discounted by the low price then prevailing.

One month ago March cotton was quoted at 18.60, and Middling spots were selling at 19.16. Today March is quoted at 19.82, and Middling spots at 20.60, showing an advance of 122 and 144 points, or $6.10 and $7.20 per bale, respectively.

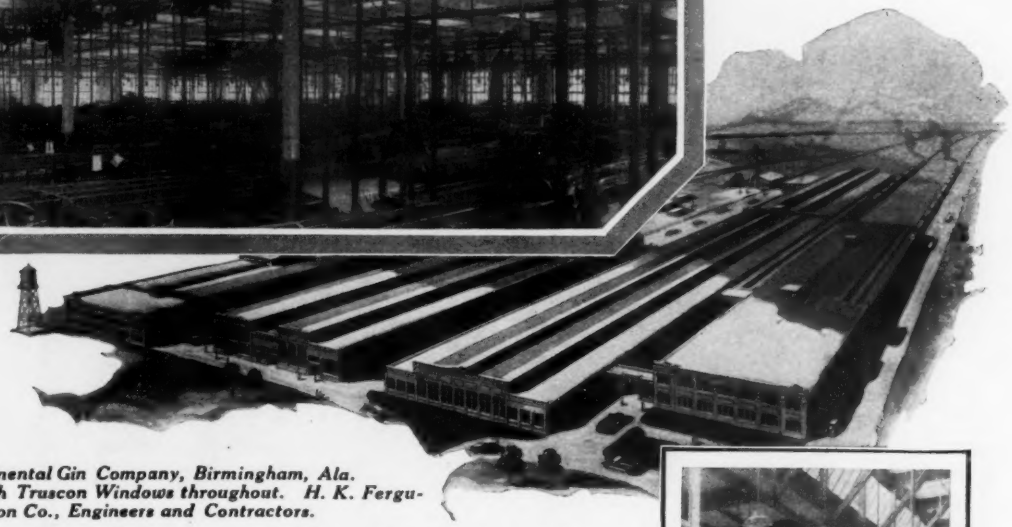
Features and developments contributing to the advance were the realization of the large percentage of low grades in this year's crop, the untenderable portion of which was estimated by Washington at about 3,500,000 bales, the decision of the Egyptian government not to permit more than one-third of the arable land of Egypt to be planted to cotton in 1926, and the disappointing outlook for the India crop, latest returns indicating only 4,660,000 bales versus early private expectations for about 5,500,000, against last year's production of 5,069,000. Subsequently advices are to effect that the Egyptian government, in order to stabilize that market and to bring about a better price for Egyptian cotton, decided to purchase 100,000 bales of Egyptian cotton.

Meanwhile the South held tenaciously to its white cotton and staples, all the more so after the developments in Egypt. The demand for good cotton was urgent, but offerings remained small, and finally there was a revival in the demand for low grades, which was reflected in larger sales in the interior and at the ports, as well as in higher prices for the staple.

At the moment prospects for foreign crops are only slightly larger in the aggregate than last season's foreign production, countries reporting so far indicating a yield of about 9,695,000 bales versus 9,592,000 last season, whereas early expectations were for an increase of from 1,000,000 to 2,000,000 larger than last season. Therefore, it would seem that nearly all, if not all of this year's increase is in America, indications of lint cotton for the United States being a crop of 15,603,000 bales versus 13,628,000 last year, much of which is low-grade cotton.

Until of late, that is, during the past month or two, spinners have been virtually out of the market, which is reflected in smaller weekly mill takings the past several weeks, but as trade is generally good, especially in the United States, and as consumption continues large, spinners can hardly keep out of the market indefinitely and must buy more freely sooner or later for their future

Virginia Woolen Mills. Truscon Steel Windows and Mechanical Operators



Continental Gin Company, Birmingham, Ala. Equipped with Truscon Windows throughout. H. K. Ferguson Co., Engineers and Contractors.

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Truscon Steel Windows and Mechanical Operators bring to your textile plant two fundamental things—full daylighting and adequate, easily controlled natural ventilation.

The perfect and instant control of natural ventilation assured by Truscon Mechanical Operators is particularly valuable in the textile industry where impure air would often cut down the production capacity of men and machines.

A Truscon Window installation aids directly in maintaining full production because the efficiency of your operatives is increased by healthful working conditions.

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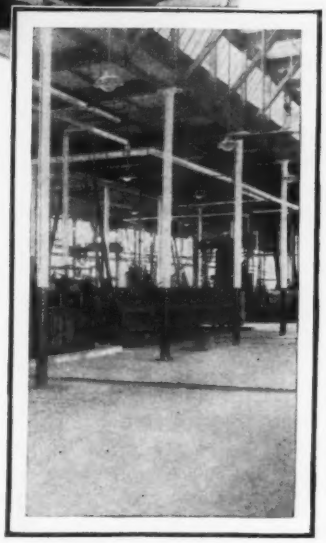


Gregg Dyeing Co., Graniteville, S. C. Completely equipped with Truscon Steel Windows and Mechanical Operators.

TRUSCON STANDARD STEEL WINDOWS AND MECHANICAL OPERATORS

*A complete line of Steel Buildings, Steel Windows, Metal Lath, Steel Joists, Steel Poles, Concrete Reinforcing for Buildings and Roads, Pressed Steel Specialties, Waterproofing & Technical Paints. Truscon maintains Engineering and Warehouse Organizations thruout the Country

TRUSCON NATIONAL ERECTION SERVICE
Assures Accuracy Speed & Economy.

requirements. They had hoped to buy at a lower price than prevailed one month ago, now they have to pay higher prices for cotton.

Consumption in the United States continues large, returns to the Census Bureau for December showing domestic mills to have consumed 575,000 bales of lint cotton compared with 534,000 for December of last season, which is a record for December by 20,000 bales. Prospects are that consumption in the United States, perhaps in Europe also, will continue of record breaking proportions.

CENSUS REPORT—UNITED STATES

	This Season	Last Season
Consumption, Dec., lint	575,271	533,789
Consumption, linters	55,701	47,738
Consumption, Dec., incl. linters.....	630,972	581,527
Consumption, 5 mo., lint	2,593,979	2,359,007
Consumption, linters	331,008	253,451
Consumption 5 mo., incl. linters...	2,924,987	2,612,458
Mill stocks, Dec. 31st.....	1,717,972	1,319,736
Stocks in public storage Dec. 31..	5,608,066	4,616,919
Total stock U. S. Dec. 31.....	7,326,038	5,936,655
Active spindles during Dec.....33,000,874		32,720,568

While stocks in the United States are comparatively large, as stated before, much of them is of low grades, otherwise offerings of white cotton would undoubtedly be free, whereas offerings of white cotton continue light, particularly of staples of consequence, which command a big premium.

The scarcity of white cotton, even of tenderable grades, is noted in the small certificated stocks in the American contract markets, here only about 8,000 bales versus 109,000 last year; in New York about 62,000 against 175,000 one year ago.

Because of the small certificated stock in the American markets, and because of a slight improvement in the demand for spots in the South of late, there has been much short covering in near positions the last couple of days, resulting in a sharp advance in the market. As yet the technical position of the market, as regards nearby deliveries, apparently remains strong owing to the inability to increase the certificated stock locally and in New York.

In celebration of fifty years of service to the textile industry, and to mark its intimate connection with the industry during the last half-century, "The Textile Manufacturer," the first and one of the leading textile journals published in England, has issued a special Jubilee Number in which contributors, well known in their various branches of the trade, review the progress of the last 50 years.

These articles take up the half-century's progress in each subject separately, cotton manufacturing, wool manufacturing, silk and linen and knitting being considered. In the section devoted to cotton manufacturing, separate articles prepared by experts outline the technical progress made during the past 50 years in cotton opening, combing, ring and mule spinning, sizing, weaving, winding, bleaching, etc. The publishers have incorporated in the Jubilee Number a comprehensive array of historical facts that should be invaluable as reference material on the subjects covered. "The Textile Manufacturer" is published by Emmott & Co., Ltd., 65 King Street, Manchester, England, and the price of the Jubilee Number is five shillings per copy.

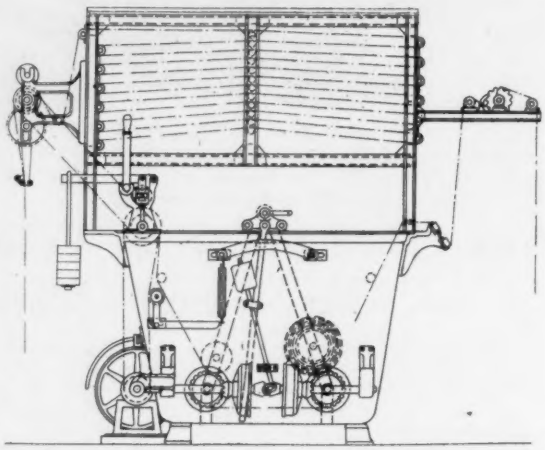
An Interesting Dyeing Machine.

An interesting type of dyeing machine with submerged rollers made by the Textile Machine Works, Berlin, is being marketed in this country by George W. Steiger, Textile Machinery Associates, 11 East 42nd Street, New York City, being especially adapted to the requirements of the various vat colors.

It is so arranged as to hold a large amount of liquor for indigo dyeing, since the indigo vat is used continuously. For the Indanthrene, Algole, Helindone, Thioindigo, etc., the space for the liquor being much smaller.

A general view of the machine is shown in the accompanying illustration, the principle being simple. One chief feature pointed out by the manufacturers is that the material is not run off from one roller onto another, but is wound onto separate cylinders; the speed always remaining the same and the goods passing with slight tension from one cylinder to another. By means of a slight pressure from a lever, the direction of the material is reversed as soon as one cylinder is full and the other empty.

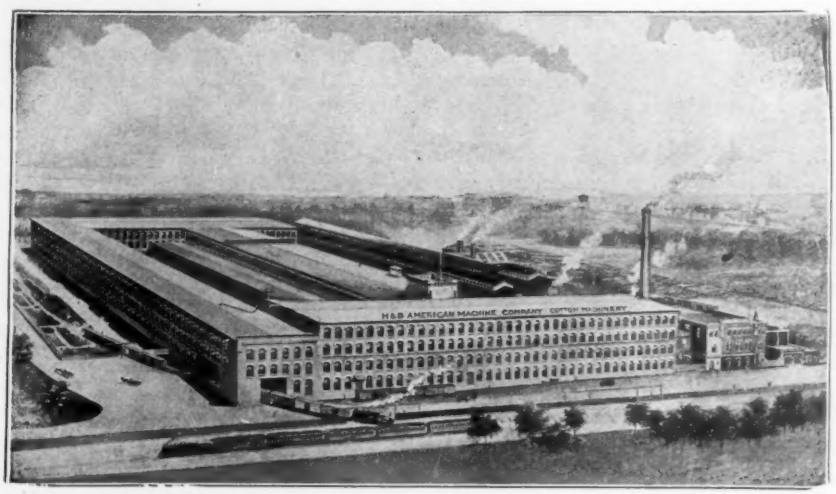
The regularity of the speed, it is stated, allows the liquor in the vessel to remain quiet and almost unmoved on the surface, it being explained that this eliminates unnecessary waste of reducing agents; also that this allows a greater speed and increased production. Special squeezing rollers are used for securing penetration.



In the large indigo machine a cylinder will hold 12 to 14 pieces of 65 yards each of a medium cloth, and the dyeing of five to six lots daily can be secured, it is stated.

For dark indigo dyeings where several reducing passages are necessary, the machine is fitted with a patented arrangement which permits the material to run below the surface of the liquor at the first turn and then, when penetrated, to pass continuously through the liquor for two or more ends, for which purpose the continuous arrangement is removable. If the material is dyed rolling, it is explained, the continuous dyeing cylinders rest in a hanging position above the surface of the liquor, into which they are let down when in use. As a result of the even motion of the material, it is stated, the consumption of hydrosulphite is materially reduced. In order to enable the padding of vat colors on the goods before their development, a removable padding trough may be used for padding the material with dye before development with the developing liquor.

COTTON MACHINERY



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SPINDLES—FLYERS—FLUTED ROLLS

Descriptive Bulletins sent on Request.

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Pawtucket, R. I.

Southern Office, 814-816 Atlanta Trust Co. Bldg., Atlanta, Ga.

NOTES ABOUT MEN YOU KNOW OR KNOW ABOUT

ALLEN LITTLE has resigned his position as vice-president of the Georgia-Kincaid Mills, Griffin, Ga., to accept the agency of the Dwight Manufacturing Company, Alabama City, Ala.

JOHN A. SWANSON, formerly connected with the Crompton Company, Crompton, R. I., has succeeded Mr. Little as vice-president and general manager of the Georgia-Kincaid Mills, Griffin, Ga.

LEWIS H. BECK, formerly general superintendent of the Cochran Cotton Mills, Cochran and Hawkinsville, Ga., has become superintendent of The Griffin Manufacturing Company, Griffin, Ga.

HOWARD D. TOWNSEND has been made superintendent of the Nokomis Cotton Mills, Lexington, N. C., to succeed John B. Wright. Mr. Townsend has been connected with the Erlanger Cotton Mills Company of Lexington, for 12 years as superintendent of carding. He is at present state senator, and has also served a term in the lower house of the North Carolina general assembly.

HENRY B. MILLER recently became superintendent of the Cherry Cotton Mills, Florence, Ala. For some time he has been superintendent of the Aponaug Manufacturing Company, Koscuisko, Miss.

C. B. LANIER, manager and superintendent of the Piedmont Cotton Mills, Egan, Ga., is receiving the felicitations of his many friends upon the arrival of C. B., Jr., on December 30th.

CLARENCE O. KUESTER, secretary of the Chamber of Commerce of Charlotte, N. C., was the recipient of a handsome new automobile which was presented to him on January 11th by citizens of Charlotte as a token of appreciation of his services to the city. A. L. Byrd, chairman of the volunteer committee which raised the money for the automobile, made the formal presentation.

SAMUEL H. LANDER, formerly assistant treasurer of the Brogon Mills, Anderson, S. C., has been made president of the newly-organized Lad Lassie Mills, Anderson, S. C. Other officers of the corporation are: James P. Gossett, chairman of the board of directors; E. P. Cofield, vice-president and general manager, and Ralph Gossett, secretary.

L. J. NEWBORN has been elected president of the Kinston Cotton Mills, Kinston, N. C., and Thomas V. Moseley is treasurer, succeeding the late J. F. Taylor.

R. D. SLOAN has succeeded R. O. Dietz in his position with the southern office and laboratory of E. I. du Pont de Nemours & Company, Charlotte, N. C. Mr. Dietz has formed an executive connection with the Portsmouth Fisheries Company.

S. M. SLOAN, of Greenville, S. C., has been made South Carolina representative for the Carolina Specialty Company, of Charlotte, N. C.

GEORGE GRICE has become superintendent of the Lola Manufacturing Company and Lola Gingham Mills, Stanley, N. C., succeeding M. C. Kirksey.

JACOB STIREWALT has resigned as superintendent of the Brown Manufacturing Company, Concord, N. C., and C. D. McDonald has resigned as superintendent of the Norcott mills, Concord. A. E. Kay, formerly with the Appleton Co., Lowell, Mass., has been made general superintendent of these mills.

J. O. BROWN has resigned as superintendent of the Greenville (N. C.) Cotton Mills.

S. W. RABB, superintendent of the Erlanger Cotton Mills Company, Lexington, N. C., will also act as assistant general manager of the Nokomis Cotton Mills, Lexington. Joe M. Gamewall, general manager of the Erlanger mill, is the new president of the Nokomis company.

G. F. LUCK, active vice-president and assistant manager of the C. H. Bacon Company, with headquarters at Loudon, Tenn., died recently, funeral services being conducted on December 20th at Loudon.

ROBERT Z. CATES, 71, president of the Arkwright (S. C.) Cotton Mills, died at his Spartanburg home on January 1st following an extended illness. Mr. Cates organized the Arkwright Cotton Mills in 1896, when he became president and manager, remaining in that capacity until his death.

EDWARD E. ARNOLD, president of Arnold, Hoffman & Co., Inc., Providence, R. I., died on December 15th.

AUGUST KLIPSTEIN, founder of the firm of A. Klipstein and Co., New York City, died on Friday, January 8th, in his 78th year. Mr. Klipstein, whose activities in the dyestuffs and chemical industries of the United States extended over a period of more than fifty years, was born in Germany in 1848. He came to America in 1871, soon establishing a dyestuff and chemical business under the name of A. Klipstein. Foreseeing the importance that dyestuffs must eventually assume in this country, he obtained the agency of Basle, Switzerland, which he held until 1920, when it was released. Mr. Klipstein also recognized that textile interests desired a common source of supplies for both colors and chemicals, and built up connections for a wide and varied line of chemicals such as users of dyestuffs might need. In 1894 the business of A. Klipstein was transferred to the corporation A. Klipstein & Company, under which name the business has operated since and will be continued. Mr. Klipstein's business career in this country covered the entire history of the coal-tar dyestuff industry. A never-flagging energy, business ability and knowledge of dyestuffs on his part exerted a lasting influence upon the advancement of dyeing in this country. Prominent among his introductions was that of quebracho, which he finally established in 1885 as a tanning extract of genuine importance. He was a member, at the time of his death, of the Society of Chemical Industry, American Chemical Society, Chemists' Club, and other organizations.

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Ponsol Red Violet RRNX Paste

THIS latest addition to the Ponsol series, even in the palest of shades, possesses excellent dyeing and fastness properties. As a vat violet it is of particular interest, inasmuch as it is unaffected by either heat or moisture.

Ready solubility, coupled with highly satisfactory penetration and level dyeing properties permits its use on all types of machines

Ponsol Red Violet RRNX Paste is used to a considerable extent as a shading color of light pinks and mode shades

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Dyestuffs Department

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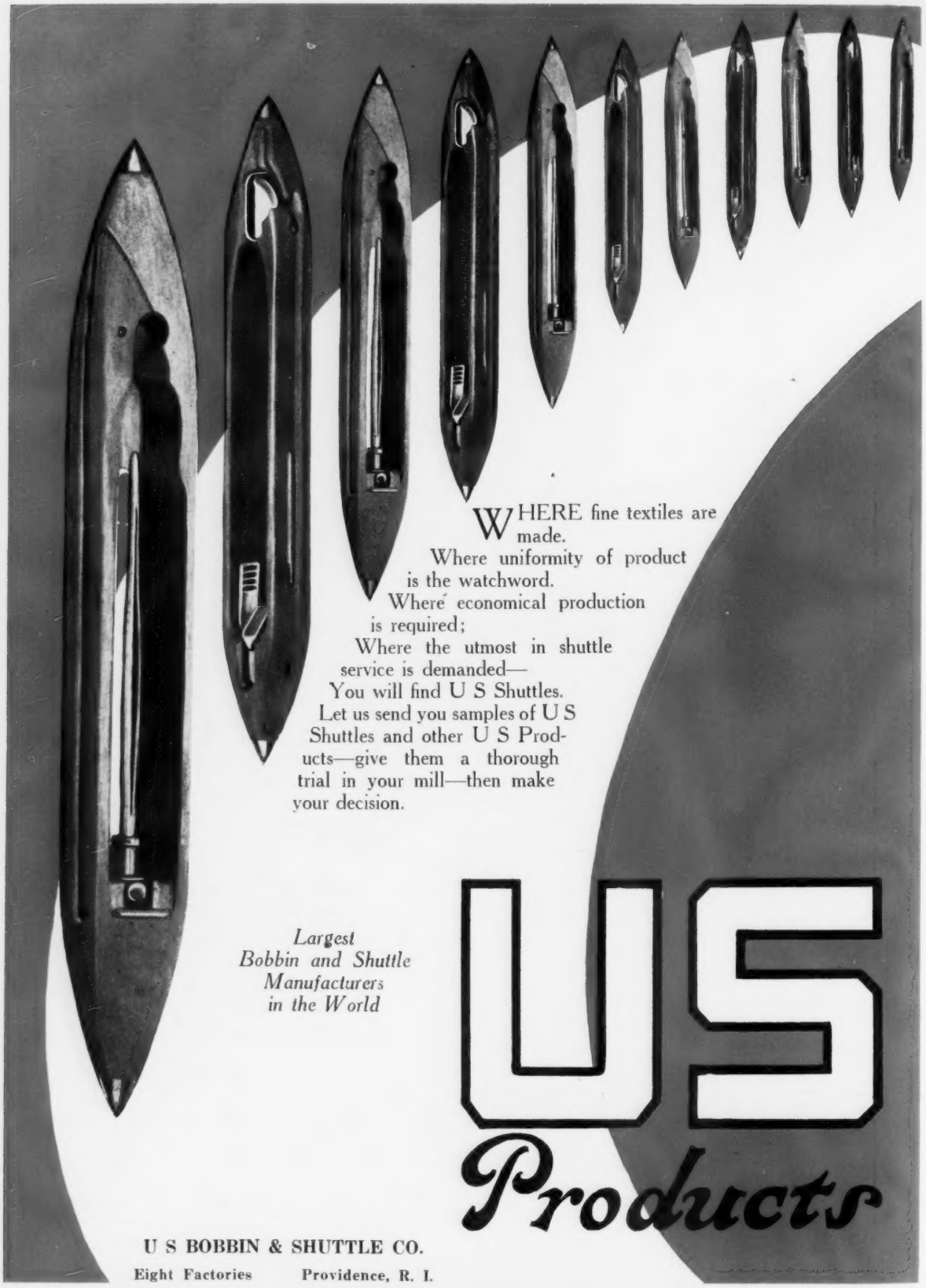
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Where the utmost in shuttle service is demanded—
You will find U S Shuttles.
Let us send you samples of U S Shuttles and other U S Products—give them a thorough trial in your mill—then make your decision.
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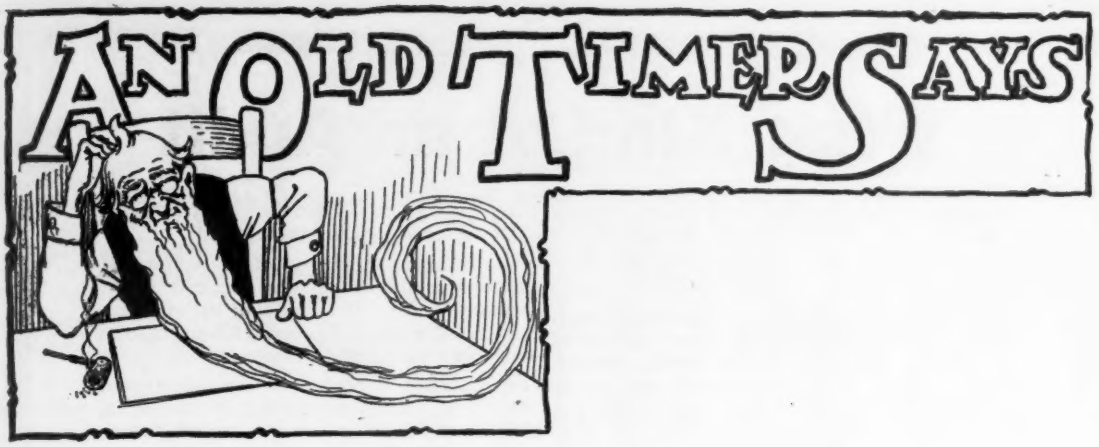

FIRED!

[Editor's Note.—For reasons which may be explained later, the article usually appearing on this page contains only one word this month. We have heard many very successful operating executives claim that some of the most valuable employees they have in their organizations are men they have discharged for slight offenses and later reinstated. Why?]

What Kind of an Audit

Audits vary in quality and scope. The *Quality* depends upon the experience, ability and application of the Auditor; the *Scope* is a matter of your instruction.

Of course, *Every Audit should be a Detailed Audit*—which is an expert and independent study in *detail* of the items represented in mass by balance sheet figures. It discloses the many important facts underlying the figures; verifies; clarifies. It brings to light avoidable leaks and waste; finds the flaws in accounting, in credit and collection methods; points to possibilities for greater profits, and is free from qualified statements of balance sheet audit.

The Balance Sheet Audit, in spite of obvious limitations, when properly made is more than a mere building up of statements from book figures without careful analysis and substantiation.

The Balance Sheet Audit can be ordered with a specification calling for a partial *Detailed Audit* covering a period sufficiently long to give at least a cross section of the business and a picture of actual conditions.

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BOSTON	CLEVELAND	AKRON	WHEELING	INDIANAPOLIS	ATLANTA	FORT WORTH
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HOW OTHER MEN MANAGE

Practical Discussions by Cotton's Readers On all varieties of Mill Subjects

We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

Kirschner Beaters and Speeds.

EDITOR COTTON:

I have recently heard some very unusual, not to say radical, views expressed about speed and settings for Kirschner carding beaters, and would like to hear what some of your commentators have to say about them.

One superintendent said that for best results on 1 15/16-inch cotton, he recommended Kirschner beaters on the intermediates and finishers to run at 1200 revolutions per minute. That is for a three-wing beater, which is equivalent to 1800 revolutions for a two-blade beater.

Another superintendent, running inch cotton, declared that he used a carding beater set at 1/32 inch from the feed rolls, and got better work that way than at any other setting.

These two statements are at such wide variance from commonly accepted ideas on the matter that I think some of your readers might be able to comment interestingly on them. Both of the men involved seemed to feel that their mills were in mighty good shape, everything running just about right, and there was no question in their minds about the correctness of their beater settings and speeds.

The first statement was surprising to me in two ways. First, because I do not find a great many mills running on 1 15/16-inch cotton using carding beaters at all; and those that do, use them almost always on the finishers alone, and at a very low speed. Six hundred revolutions a minute would probably not be a bad average for beater speeds where carding beaters are run on 1 15/16-inch cotton, and a speed of twice that was certainly surprising.

M. C. (MASS.)

More Slack Selvage Discussion Requested.

EDITOR COTTON:

I have read with a great deal of interest the letter from "J. F. L. (Ala.)" appearing in the "How Other Men Manage" department of December COTTON, relative to slack selvages on warper beams. Having been an overseer of both warping and slashing for a good number of years and having read the discussions in COTTON, which have always been most interesting, it was most natural that I should feel disposed to comment, even though I have not been accustomed to entering into such discussions.

Referring to the latter part of the letter from "J. F. L.," he indicates that, assuming the spacings of the front comb are absolutely perfect, slack yarn at the selvages will be a thing of the past.

I would like here to say that this was tried by the writer ten years ago, and, I know, has been tried by others with very little success. At one mill at which I was employed, we even took out all our ordinary straight combs and replaced them with the later type, the zig-zag, and even then we had slack selvages, I have, in fact, tried every conceivable thing, but still have slack yarn at the sides.

Any method suggested by the readers of COTTON which would have a tendency to eliminate, to any small degree, these slack selvages, would be much appreciated and given an immediate trial by the writer. J. R. (MASS.)

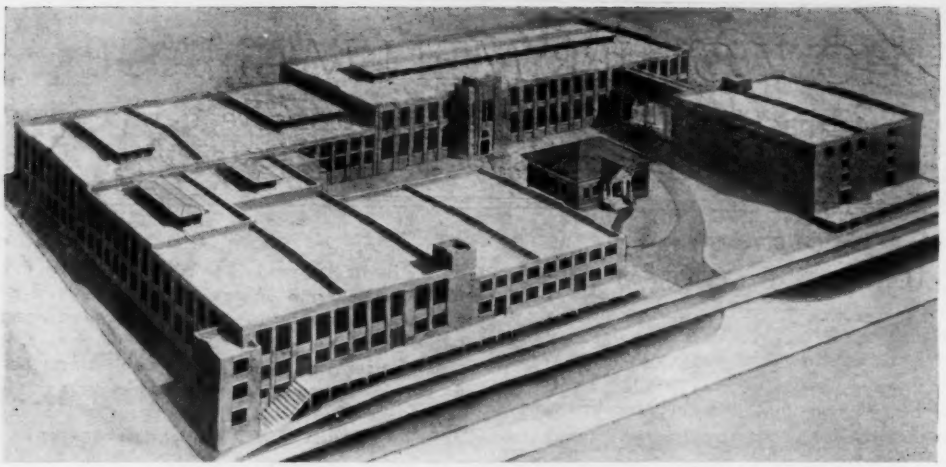
Thread Laps in Spinning.

EDITOR COTTON:

In reading the different answers to the letter from "Bert (R. I.)" in the September issue of COTTON concerning "laps" on the front steel rollers in the spinning room, brings to mind the fact that sometime ago we had occasion to replace a number of leather top rollers in the spinning room, and thinking that this would be a good time to get all of our front rolls replaced with newly covered rolls, we began by putting all newly covered rolls in the front stands and placing the other ones in as back or middle rolls. We found a considerable increase in the ends down on the spinning over what had been the custom, and by closely watching, we found that the newly covered rolls were the cause of this, so we decided to run the newly covered rolls in the back stands awhile and then replace them on the front, as they were needed, as the ones on the front stands went bad. This method worked very satisfactorily and we are now breaking in our newly covered rolls in the back stands. This gives them a chance to set themselves in smoothness and evenness, in thickness and diameter, and causes the roving to draft more evenly and with less likelihood of unevenness by the variation of the different things that happen to be in the covering of the rolls.

Of course this may sound very erratic to say that certain unevenness occurs in the top rolls of the spinning and that this should not be. Nevertheless, it is true in every mill roller covering shop, and even with the shops that claim not to put out anything but perfect rolls.

Regarding the "licking" or "sticking" of the ends on the spinning, there are a number of reasons for this, some being the same as those given to "Bert (R. I.)." Some are due to the temperature of the rolls, and we could hardly



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The construction of bleachery floors has ceased to be a vexing problem to the mill engineer. Nowadays he specifies Creo-pine Sub-flooring and eliminates floor troubles for all time.

The picture above shows the new Thomaston Bleachery at Thomaston, Georgia. Robert & Co., Engineers, Atlanta, Georgia.

Your architect or engineer has used Creo-pine. Ask his advice about its economy and durability, either for new construction or replacement.

Wolman Salts Treatment for Mill Timbers Requiring Paint

After a thorough and painstaking investigation of the merits of Toxic Salts Impregnation treatments for Timbers requiring paint, we have equipped our Atlanta plant to produce timbers by the formula and process of the Wolman Salts Treatment.

This formula was discovered and first used in Europe in 1904. Its use has been continuously successful since that time. Timbers treated by this process can be painted. It is clean and odorless. It may be planed and manufactured after treatment. It is fire retardant. It withstands dry rot, prevalent in cotton mills. We have issued a folder completely explaining its advantages. Ask for folder (C).

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change the travelers to suit all of these difficulties, but we can strike a happy medium and closely watch the ailments of the steel and top rollers. Too much oiling, too much dampness, etc., all have their place in the cause of the yarn lapping around the steel rollers, but ordinarily, this difficulty should be very quickly discovered and remedied. We often look for the larger things when seeking to correct difficulties when in fact it may be something very small.

T. A. D. (GA.)

A Ball Bearing Rocker Shaft Box.

EDITOR COTTON:

I am sending you a photograph of a new kind of rocker-shaft box for looms which will probably interest some of your readers who have had the usual troubles with the rocker-shaft and boxes.

The two views show the box assembled, and the parts that go to make it up. It consists of a cast iron mounting, with a specially designed ball bearing pressed into it. The mounting fits on the loom in the same manner as the present plain boxes, and the bearing, which has an extended inner raceway, can be fastened securely to the shaft with the set screw shown in the picture.

This makes a simple and inexpensive arrangement which only costs about the same as new plain boxes and a new rocker-shaft, and if the rocker-shaft has never been turned, you can turn it when you put on this ball-bearing-box, and the set screw will press down on the worn, flat side of the shaft and hold the good side to the bottom of the bearing race, so that the old shaft will do as well as a new one.

The box is greased with a tip like that used on automobiles, where the grease is forced in under considerable pressure, and of course the box is always sure to be completely filled with grease every time the gun is used on it. Keeping oil in them has always been one of the main troubles with rocker-shaft boxes, and then too, starch from the warps falls down on them, and some starch gets in the oil holes and around the edges of the bearings, and it works into the bearings and stops up the oil holes. This ball bearing is fixed so that nothing much could get in it from the outside, even if it was not full of grease, and when it is packed full of grease under pressure until the grease squirts out around the shaft, anything that might be trying to work its way in would be pushed out again, and the box will stay full of good, clean grease.

As I said before, this is a special ball bearing that was gotten up with the idea of making a bearing that was strong enough to stand the work, and still be cheap enough to go on a loom at a price a man could easily afford to pay. Ball bearings like those used on picker beaters and fans, and on cards and spinning frames are so expensive that you could hardly afford to buy boxes equipped with them for looms. So this bearing is made with a machine finish instead of a grinding finish like they give the high-speed bearings, and it only costs about a fourth as much as the other kind, but for such slow speed work as a rocker-shaft this bearing works all right and is economical to put in.

There probably is not a mill using automatic looms that does not have more or less bother with these rocker-shaft boxes, and almost anyone running a weaving job will be interested in seeing something that seems to fill the bill for rocker-shafts.

K. H. (MASS.)

Grinds Wire in Bobbin Cleaner.

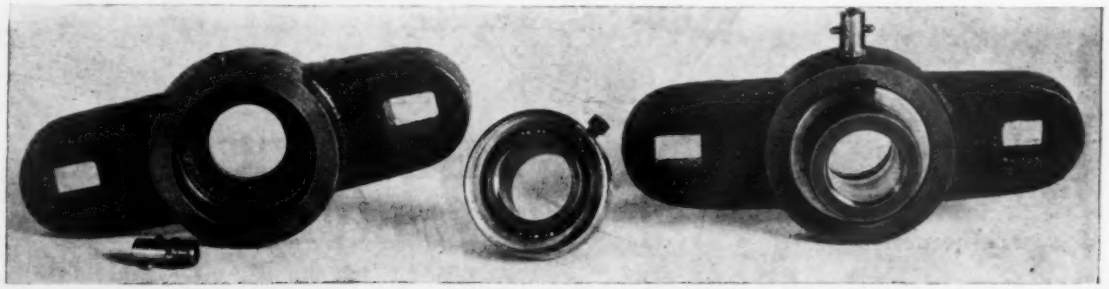
EDITOR COTTON:

One subject I have not seen discussed in "How Other Men Manage" is that of the Termaco bobbin cleaner. This machine is, as you know, in use in a great many cotton mills throughout the United States and abroad, and is undoubtedly a great saver of time and work and, I say, all due praise and respects to the inventor.

There is one question regarding it upon which I should like to see some opinions from other practical users of the machine, not in the spirit of criticism of the machine, but rather to present to your readers the experiences of mill men in operating it. My question is whether anyone else has found any necessity to grind the cylinder fillet in the machine, and if so, how it is done.

I was informed a short time ago, by an authority on this matter, that unground clothing would always give satisfactory results, but having proved the opposite, in my own opinion, I could not agree with him. When our machine was new, and everything was adjusted for roving bobbins which were partly covered with about one layer of roving, all went well. About three weeks afterward, however, I noticed imperfect stripping of the waste on the bobbin, and naturally I resorted to the leather straps provided to hold the cylinder, and tightened these somewhat, taking them up considerably in order to strip the bobbins clean. But I made a mistake. I found unpleasant looking scratches on the surface of the bobbins, which ended my idea of strap adjustments. Then I decided upon the "forbidden measure" and resolved to grind that fillet.

I did this by removing one of the bars on the bobbin carrier and reversing the direction of the cylinder, holding a hand strickle as level and as firm as possible with the cylinder running at full speed. I put an edge on the wire and it performed the work excellently and to my satisfaction when I tried it again with the same kind of roving,



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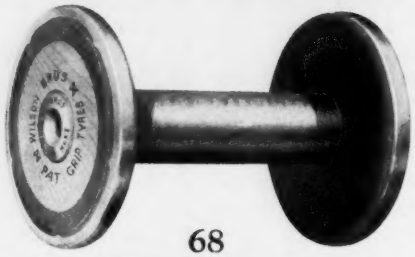

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proving, to my mind, that grinding is necessary from time to time.

I am more convinced on this point because I know that the surface of the wire fillet continually receives unequal work as the waste on the bobbins is not always in contact with the same portion of fillet at the same time, and therefore it is possible that parts of the fillet hardly deal with the waste roving, while other sections are overworked. Hence the necessity of at least levelling up the wire surface on the cylinder. Of course this levelling or truing up of the wire surface cannot be accomplished by hand strickle grinding, as our friends well know, but it may interest them to learn that I have designed a device for this purpose which I hope to put into use after securing patent rights for it.

I am interested to know if other mill men have had the experience I have mentioned, and I would like to know their opinions concerning the grinding of the fillet. It seems to me that if this cylinder fillet does not require grinding, the cylinders must be covered with unground clothing when they are made, and by the way, this is news to me, if the clothing manufacturers are making it this way, because I understand that the fillet is always ready for use on the cards or other machines. So it seems to me that ground clothing is used on these machines, in the first place, and even if used clothing was employed, this would have to be trued up, and there is only the mechanical way of accomplishing this operation. I hope some of the readers of "How Other Men Manage" will enter into a discussion of this point. It is probably one which many do not understand or trouble about, but I have found that I can increase the value and efficiency of a valuable and efficient machine in the manner described.

R. E. T. (R. I.)

Bleaching and Finishing Colored Shirting.

EDITOR COTTON:

I have received a sample of a bleached colored shirting from a fellow finisher lately, and he requests that I should answer him in the columns of "How Other Men Manage," as to how this is usually finished, and the commonly used practice in handling such goods at other mills. In order to make the answer more intelligible to your readers, so they may know what I am talking about, I will give an analysis of the sample.

In the first place, he mentions no width, weight, length, etc., and sends no particulars—just a small sample—therefore my answer must be of a general character. The goods are made on a dobby loom, and are light, say about 30s warp and 26s filling, and the pattern is about as follows:

Warp.

40 White, single.
2 Black, double.
1 White, single.
2 Blue, double.
1 White, single.
2 Blue, double.
2 White, double.
4 Blue, 2 x 2.
2 White, double.
2 Blue, double.
1 White, single.
2 Blue, double.
1 White, single.
2 Black, double.
40 White, single.
2 White, double.

Filling.

All White, single.

On each of the 40 white places—about two inches in distance from each other—is a head of a rose or some

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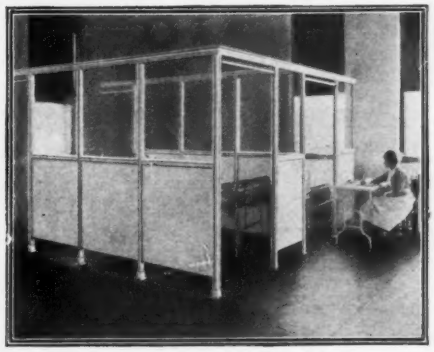

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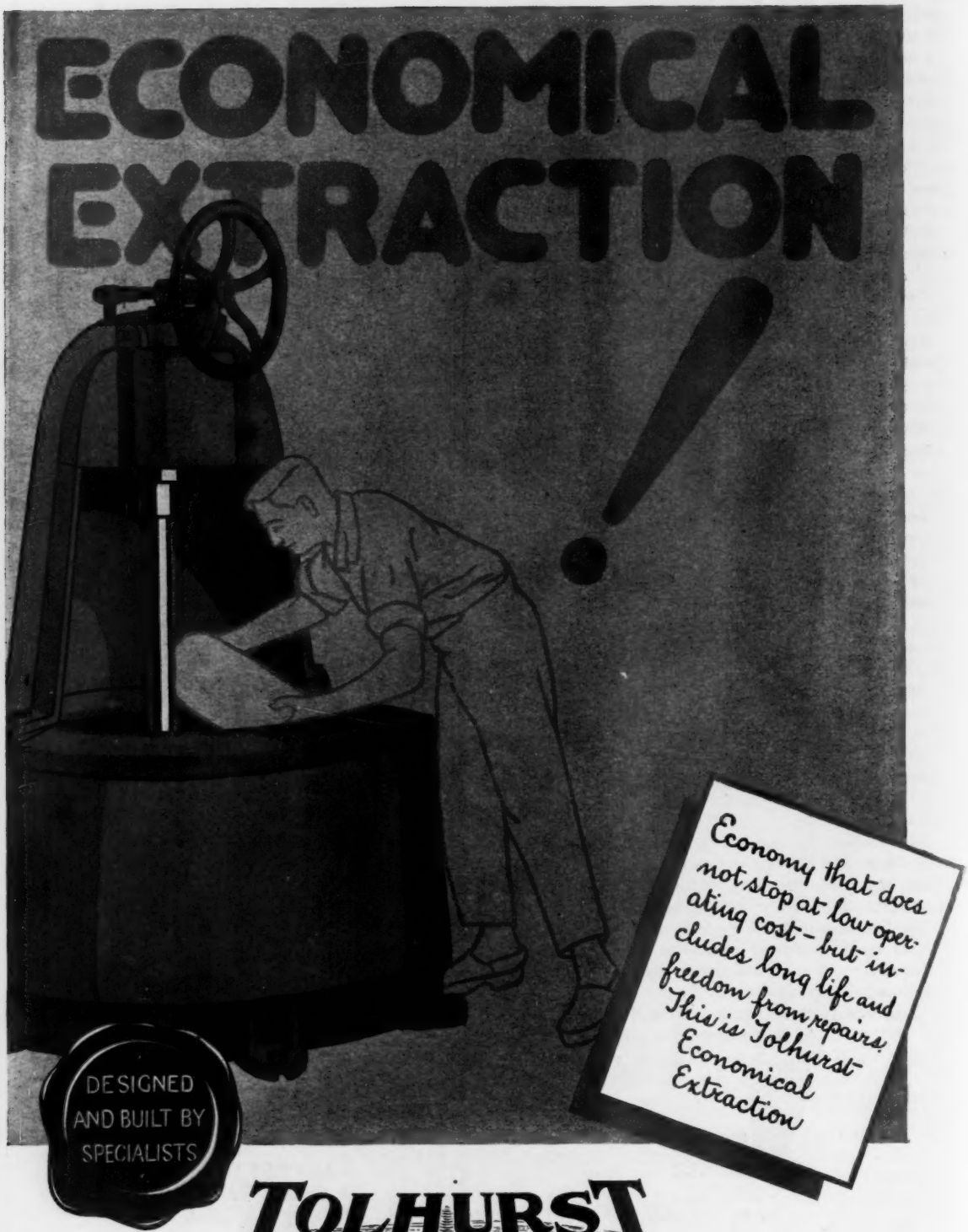
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such flower—it must be remembered that all of these figures are guess-work and not infallible.

In the first place, the goods must be woven in the grey and then bleached, where they will lose probably three inches in width. They may be boiled if soda ash is used, or run at width; at any rate the colors must be fast and the bleaching quick and mild. They must then be dried on the cylinders and when cool are filled and dried on the starching range—i.e., starch mangle and dryer—with the following mixture: Potato starch, 50 pounds; oleine oil, 1½ gallons; Ultramarine blue, ten per cent, one pint; water to make 100 gallons when boiled. Boil for ten minutes.

After filling, stretching and drying on the range mentioned, the cloth is allowed to cool. It is then conditioned on the damping frame and allowed to lie for two hours, after which it is cold swiss calendered on a five-bowled compound lever calender, using heavy pressure. The cloth is then ready for making up, etc. These goods, like his sample, are probably as follows in construction: Length, 120 yards; width, 34 inches; counts per ¼ square inch, 20 x20; weight, 26 pounds; finished width, 31 inches.

There is also another way in which shirtings are finished at some places—these, however, are Oxfords, in which the filling is doubled. Following are the particulars of the goods in the loom: Length, 60 yards; width, 29 inches; counts per ¼-inch, 24 x 11 (in which the 11 is double); weight, 11¾ pounds; finished width, 28¼ inches (2 x 2 weave) and these are unbleached.

After weaving, the cloth is conditioned on the damping machine and allowed to lie for two hours. It is afterward glazed on a three-bowled dead set calender, using a medium pressure and a high pressure, after this it is ready to make up. No starch. In many places, fine shirtings, 21 x 22, etc., are first mangled through cold water, dried over dry cans, beetled for 30 minutes at each end, starched on a two-bowled mangle, calendered and made up or folded. Starched and calendered as described.

It must always be remembered that Epsom and Glauber's salts are now used largely as a finishing substance on all kinds of shirtings, and that there are many ways of getting at the finish required, but all amount to the same thing, which in the case of shirtings means—fill well, a good color and feel, and little or no finish.

I would advise this man, and others interested, to read the article, "Finishing Woven Dress Goods," on page 171 of the December number of COTTON, which contains some points not mentioned herein. CONTRIBUTOR No. 3245.

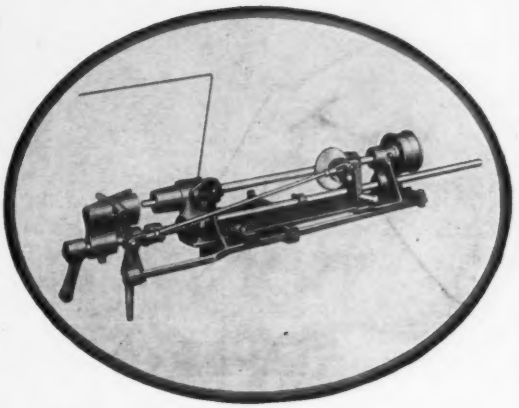
The Cause of a Carding Difficulty.

EDITOR COTTON:

In the November number of COTTON I note a question by "C. B. T. (S. C.)" concerning his difficulty with an old Whitin card, stating that he would like to know what causes a portion of the stock to roll and drop between the arch and cylinder, and in reply I wish to say that there are many causes for this evil; (1) the sheet of lap being too wide; (2) worn licker-in teeth on the ends of the licker-in caused by the sheet of lap being doubled by the lap guide. The space at this point allows the cotton to be taken up in a matted state which escapes to the arch and is taken down by the cylinder; (3) too great a distance between the toe of each flat, which cannot be remedied.

WASH (R. I.)

LAZENBY FILLING WINDERS



THE filling produced on the Winder above contains 100% to 200% more yarn than a spinning frame can put into the shuttle. This means fewer shuttle changes, less waste and increased loom production.

The action of winding serves as an inspection to the yarn and spinning defects are discovered before they get into the cloth. Spinning is more flexible and spinning production increased. Better cloth is produced because the filling is put onto the bobbin under even tension, and it comes off the same way.

These are a few reasons why you should investigate LAZENBY Winders for your work. A testwind Report will put all the fasts before you, and such a Report costs nothing,

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I understand that the makers of the vacuum stripping system have changed their piping arrangements so as to eliminate the kinking and wadding of strips. Larger pipes, and longer curves on the turns are claimed as cures for this trouble, but of course it costs a lot to change a mill now equipped with the old style piping. I have heard a lot of men complain of the same trouble "T. A. B." mentions in connection with vacuum stripping, but most of them put the damage to the strips at the head of the list.

I know one man, operating a large yarn mill, who does not use any of his own card room waste except roving, and who garnets his vacuum strips before selling. He claims that simply by opening these strips at a nominal cost, he adds four or five cents a pound to the value. I know another mill where the vacuum system has been discarded because the management claims the loss on the sale of the strips is too great.

The points that "T. A. B." mentions are all mechanical; the only possible economic point being damage to the clothing. He will have a lot of company in his beliefs, as many carders hold exactly similar views. Here, as in so many other mill questions, a lot depends on what the mill is making, and what sort of stock they use. A mill using good cotton, carding lightly, and stripping often, will not have as much trouble with failure to get clean stripping with the vacuum as will a mill running low grade cotton or waste, carding heavily, and allowing the clothing to get pretty well loaded before stripping. A mill carding good stock lightly, and not stripping very often, is not as likely to have trouble with the vacuum loosening up the clothing as will a mill that has to drag matted cotton and trash out of a well loaded cylinder. A mill running low grade stock that is liable to contain oily waste, is certain to have troube with vacuum stripping.

Most mills using a vacuum system will regularly strip at intervals with the roller, or will run a burnishing roll through the clothing to take out the little seed and motes that the vacuum missed, and to polish off the wires where they have an accumulation of oil or the waxy content of the cotton itself. Very few will go from grinding to grinding without the use of a roll of some kind.

The two great arguments against the roller for stripping are dustiness and damage to the clothing from facing caused by not having the roll running up to speed in stripping. The first complaint has been eliminated in those systems using a roller, but employing a pipe to carry away the dust and fly, or the strips as well. The second trouble rests entirely on the grade of help employed in stripping. Careless strippers will let their brushes get in bad shape, and will let the bands get slack so that the brush will not run fast enough.

There can be little doubt that a properly stripped card will be cleaner where a roller is used than if vacuum is employed. And by saying "properly stripped" I mean that the job has been done in either case as well as it can be done with the method used.

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In regard to bad ends on the stripper roller, this is important and it should be kept in good repair. Bad ends on the roller are due to bumping the roller against the door or coiler head of the card in taking it out of the stands or putting it in the stands to strip. Those doing the stripping should be cautioned not to bump the roller in transit.

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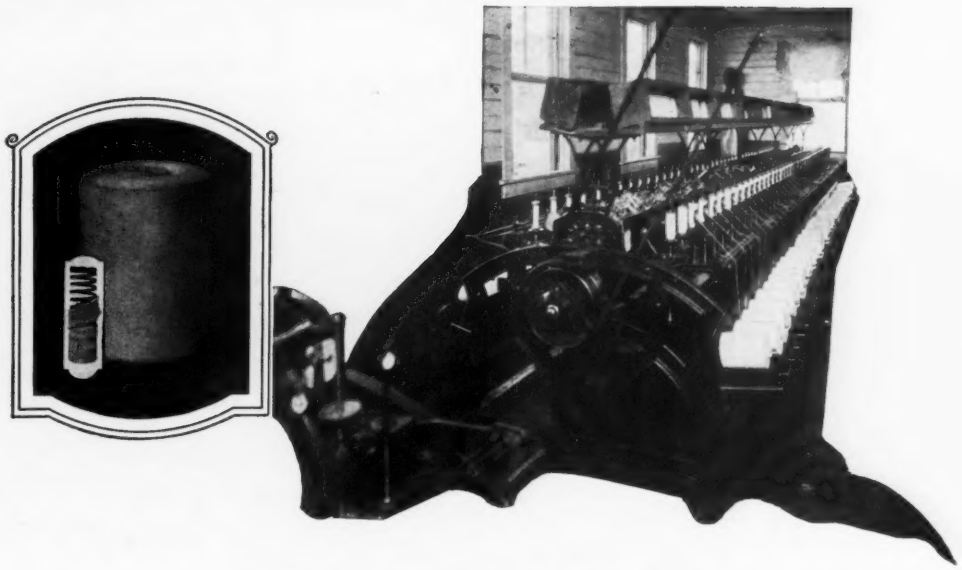

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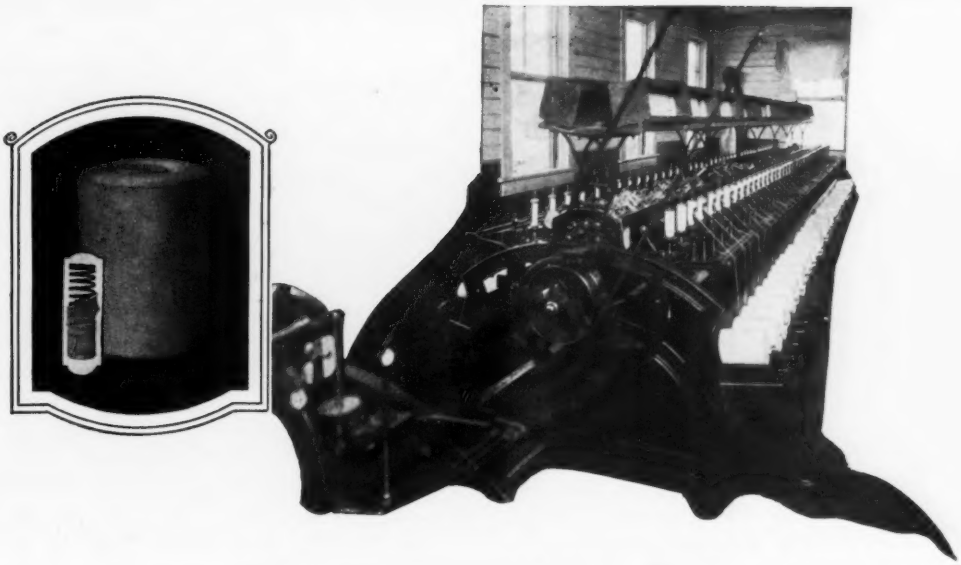

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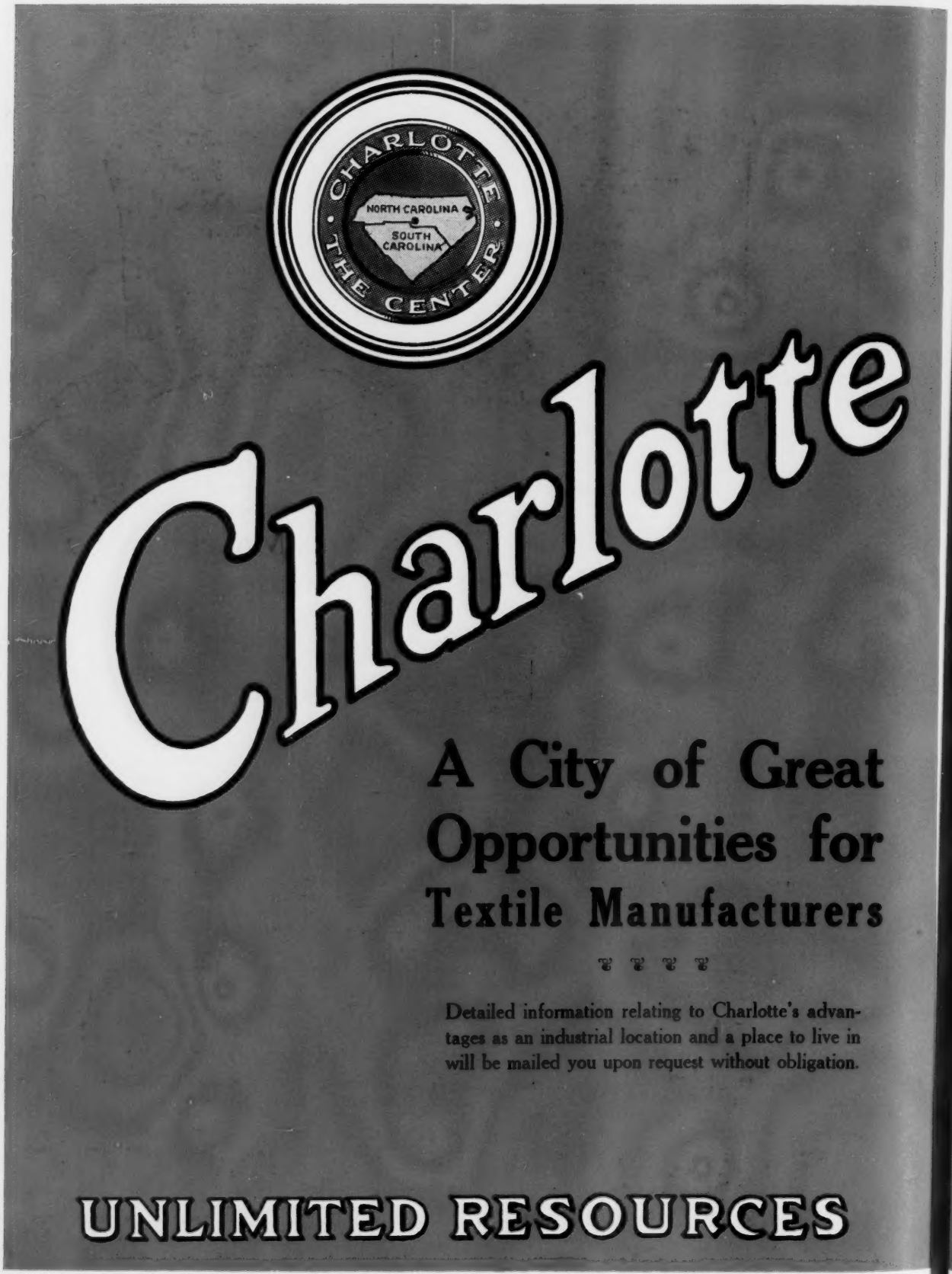
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Mill executives of some of the smaller mills have seriously questioned whether a Termaco Roving Bobbin Cleaner might be profitable for them though in larger mills it had been proved to pay for itself more than three times a year.

To obtain exact data, an engineering organization, the A. C. Nielson Company, was retained to make an exhaustive investigation of costs and savings where a Termaco was installed in a 12,000 spindle mill.

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Complimentary copy will be mailed upon request. Merely write our Engineering Department for ***Nielsen Survey No. 13.***

The TERRELL MACHINE COMPANY Inc.
Charlotte, North Carolina

to the right depth and not scratch the face or foundation of the clothing.

If the proper vacuum is kept up in the vacuum tank and the vacuum pump is in good condition, it is no trouble to get good results from the vacuum stripper and save money for the company, as one operative can do the stripping, but, on the other hand, without the vacuum stripper an extra card stripper is necessary, which means about $2.50 a day extra added to the payroll, which would eventually pay for the installation of the vacuum stripper, to say nothing of the difference in price of the strippings when sold, as they are much cleaner, having practically no dust in them.

I do not think the suction from the air nozzle is detrimental to the clothing unless the clothing is already in a condition where it needs redrawing.

There are a number of things that will cause the clothing on a cylinder or doffer to become loose, among them being heavy carding with a close setting, and the screen rubbing. Excessive heat from a small choke around the arch or door of the card sufficient to heat the rim of the cylinder will cause the tail ends to get loose. Too deep a setting of the stripper brush will cause the clothing to come loose. In a very damp climate, where a real close card setting and heavy carding is being done, the vacuum could be sufficient to cause the clothing to raise and rub, making what are called "blisters." L. F. J. (ALA.)

EDITOR COTTON:

There are arguments pro and con on roller stripping and vacuum stripping.

Roller stripping will keep the hook off the wires insuring against fibers and trash clinging to them. A roller that is cared for and has its ends in good condition will strip clean all the way across cylinder and doffer. However, a grinder must be very careful and see that his stands are not too deep, as I have seen new fillet ruined by stripping rollers where the stands were too low. To test stands on a card that has been newly clothed the roller should be put on the cylinder and doffer while the card is stopped and make a clean strip on the wires about 2¾ inches long. The grinder can then rest assured that his stripping will be all right if he tightens up the nuts on the stands.

Vacuum stripping is much easier and cleaner than roller stripping, but more expensive. Whether cleaner cards, less dust, etc., is worth the difference in cost is to be decided by the overseer and superintendent. The vacuum stripper is a good stripper, but it also has its defects. Where there is a hooked fillet it will not strip clean. Particles of leaves, dirt and other matter will get in between the wires and the pipes will not suck it out. Stripping hands need to be watched closely on account of starting the stripper across the doffer before the doffer has made its full round and also in taking the pipe off before it finishes. Where oil has made its appearance on the ends of the doffer and cylinder and trash and the fibers have formed a gummy substance, the vacuum will not strip it out. To keep the doffers in good condition at all times a grinder must keep on the lookout every day with a hand-card in his hand. He must also be careful about seeing that the doffer stripper is not close enough to the fillet to touch and make it "shiney."

Sometimes the little pipe on the cylinder stripper will get out of the slot and push the plate into the cylinder, facing it.

When the air runs too high it is likely to draw too tight on the fillet, making it loose. Then there is trouble sure enough.

Taking everything into consideration, I would advise anyone to stick to roller stripping, for in the long run it will pay. It may be old-fashioned but it is tried and found to be true. Just treat the old roller right and clothe it at reasonable intervals and it will give good service at a minimum cost. M. L. B. (S. C.)

EDITOR COTTON:

I agree with "T. A. B." on some things he says about vacuum strippers in December COTTON, and on some I do not. I think he is right about the vacuum stripper not getting as great an amount of neps and hulls out as the stripping brush, but I do not agree with him on the brush being the quicker. I cannot say whether or not he is right about the brush keeping the points of the clothing sharp, but I do not think the vacuum damages the clothing; if it does we have not been able to discover it. As far as having to strip two or three times to get them clean, we hardly ever have to go over more than once. I think the clothing wire must be hooked where a fellow has to go over two or three times to get one stripped.

I will say further that the vacuum stripper has increased our production and cut down the cost. Before we put in the vacuum stripper we had to work three hands on thirty-six cards, and since then, we only work two. We do not have much more dust around the cards than we do around the speeders. We seldom have to change help on cards, and if "T. A. B." comes through our card room he will not see anyone with a rag tied over his mouth. We strip our cards with the stripping brush every few weeks.

I hope to read more about stripping.

J. R. R. (S. C.)

EDITOR COTTON:

Having just noticed the article written by "T. A. B. (Mass.)" replying to "Wash (R. I.)" in the December issue, regarding the use of the vacuum card strippers against the old roller brushes, will say, the position he takes is different from mine, and I should like to say a few things on three points which he makes.

In the first part of the second paragraph, "T. A. B." says that the roller brush will keep a better point on the wires than the vacuum stripper will. Let me say it has been my observation that the vacuum stripper has a tendency to keep the card clothing sharper than does the roller stripper, for when the card strippers put the roller stripper onto the cylinder they more often place it before the cylinder stops than they wait for it to stop, and when they do, they grab hold of the wheel on the end of the roller brush, stop the stripper roll and put the stripping band on. In this way the wire point on the cylinder clothing is running against the wires on the stripper roll with the roller stopped, which in my opinion knocks some of the points off the cylinder wires. It is certainly not making them sharper by butting points together, and as far as keeping them cleaner is concerned, I don't claim that the stripper rolls do not have to be used at times to keep them absolutely free from those neps and some other foreign matter, but it is not so often, aside from the times that the cards are ground, when, of course, the rollers and

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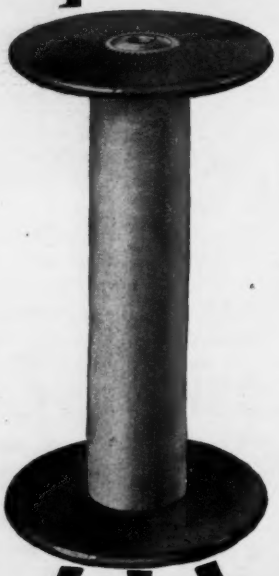

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burnishers are used to clean them thoroughly, but if the points on the clothing are kept free from hooked points, there will be very few points that hold any of those neps; the vacuum will get the majority of it anyway. Then think of the extra amount of production which is gained by using the vacuum stripper. With the vacuum stripper we only have two cards that are not putting production through ahead of the strippers. With the rollers, I've seen as high as 14 cards ahead of the strippers stopped for stripping.

The latter part of the second paragraph in this letter from "T. A. B." deals with the cleanliness of the work, which is partly explained in the foregoing. However, that which is not taken out and which can be seen in the bottom of the foundation of the clothing is not likely to shed itself into the card sliver. It will remain until this extra brushing out is done, which, with us, is about once a week. We can see no bad effects in the finished goods and in the requirements of our buyers. They say nothing of what is left in the foundations of the clothing, which "T. A. B." speaks of, so what's the use? In substance, it is very slight. However, it may be that we are doing this other cleaning at other places and not having as much in the clothing as "T. A. B." has. We often make one machine do more than it is ordinarily required to do to get by, and at another time with less. I'm not familiar enough with what "everybody's" doing to know whether we are doing this or not, but we are satisfying our customers with the vacuum stripper work, except of course, the vacuum strips; not many dealers care to pay much for them.

In the first part of the third paragraph, this correspondent says "with the continual suction on the clothing it will eventually come loose, or in other words, the wire will back under." I wish to ask, how can a 25-inch vacuum coming out of a ¾-inch open surface, have that much effect on card clothing that is put on with 275 to 300 pounds pressure with a card clothing machine and tacked, as it is on the cylinder? Candidly, I cannot see it, but at the same time, that is what one man thinks, which is worth that much, and no more. T. A. D. (GA.)

EDITOR COTTON:

After reading the excellent article by "T. A. B. (Mass.)" in December COTTON on card stripping, I feel prompted to form some comparison of the two existing means of performing the operation of card stripping. In this I wish to mention the advantages and disadvantages of these methods of stripping, as I have found them by actual experience with both, for a considerable number of years.

I am fully aware that vacuum strippers have been greatly improved since the first Cook's patent stripper was used, a good many years ago, but at that time this idea of card stripping was considered a great improvement, and so it was, but only for the operative, though that was a great deal. This idea was used in several mills in England, who considered the welfare of their help in the card room, owing of course to the elimination of so much dust, etc., from the room, which flew around at stripping time when the stripping brush was in use.

However, in several mills the stripping brush was absolutely discarded for the new idea and the new method of stripping took its place until—

Until a change was noticed, and that change I think some of the readers will have noticed if they have been

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under the same conditions. The change I may say, was noticed in the card webs very soon after stripping, an unusual condition at the same time, when the old stripping brush had been in operation. What was wrong? The cards had been stripped properly by the vacuum process, was the answer. Still those card slivers were inferior and neppy very soon after stripping. This was too bad indeed after this method had proven to be such a boon. But as I said before, it was a boon to the help, but for the performance of actual work, in comparison to the old method, it proved inferior. This is a little history with which I am very familiar.

At the present time we have some better ideas in the vacuum stripper line, that is, in respect to the make of these accessories, but this will not help a great deal to have our cylinders and doffers stripped as intended.

The vacuum process may be all right to draw a dusty or a dry load off a flat surface, or anything free from obstruction, but in the case of stripping wire fillet, of a regular pitch, we have an entirely different proposition.

All carders know that the surfaces of the cylinder or doffer fillet are like so many teeth, and that these are bound to become clogged with foreign matter, and also that in many cases there is a kind of cellulose which adheres to the points of the wire during carding, which of course depends upon conditions, quality of stock, etc.

My experience is like that of "T. A. B."; I have tried all available means at various times to overcome the difficulty. I find that vacuum strippers will not remove satisfactorily from the fillet all that is necessary for good carding, and I must say with "T. A. B." that the vacuum process has nothing on the stripping brush.

By the way, "Wash (R. I.)" does not seem to have had very much experience in the art of card stripping if he thinks that he has received benefit from using vacuum strippers, though perhaps he is using them on cards from which quality is not so much desired as, say, production.

However, we must have one good word of appreciation for the vacuum stripper, as perhaps it has helped to make the atmospheric conditions a little more healthful, but as for helping the production of good quality card sliver, I hand it to the old stripping brush or roller. I know that stripping with the brush is a very dirty job, also a hard job, having performed the work myself, but regarding the dusty part of it, I know that this can be eliminated by means of an attachment on the brush itself, and probably some of the readers will have seen and used these to advantage.

However, the stripping brush, in my opinion, has been, and is, the best and only means of stripping a card cylinder, or doffer, of all impurities which are detrimental to the function of carding, that is, when this brush or roller is in proper condition, regarding its covering of the proper numbers and grade of fillet, and when the latter is adjusted to the proper depth in the fillet to be stripped.

"Wash," according to a recent issue of COTTON, states that stripping brushes should be renewed with fillet about every week. I am pleased to know that he will not mislead some of us old-timers by having us try that idea, though I must inform "Wash" that he will benefit a great deal by having his stripping brush clothed better in future, so as to last a few months, and also instruct his strippers regarding the handling of the brush, especially not to "bang" the ends of the clothed surface on the stripping

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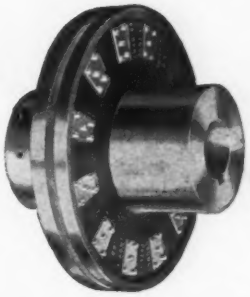

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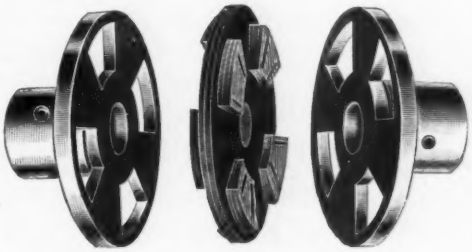

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box, or elsewhere. But if he is still using vacuum strippers he perhaps will not need that little pointer.

The stripping brush, when in good shape, will perform the operation of stripping, and will always prepare the two organs which are stripped to receive a new load of stock and prove a means to good carding, providing the card itself is in good shape in regard to settings and the condition of the wire; but any good carder will have these conditions, and also, as "T. A. B." says, a good carder wants his fillet stripping clean and also regularly. I agree with him and stand by the stripping brush for this reason, having had ample experience with both methods.

Probably your readers know that some mills that have adopted the vacuum process have to resort to the brush a few times each week at least, in order to obtain satisfactory conditions to some degree.

There is one little point in "T. A. B.'s" letter, concerning the benefit derived from using the brush to help to keep a point on the wire, with which I cannot agree. I think the stripping fillet may tend to burnish the point, similar to the regular burnisher wire, rather than help to keep the point. I do not think any stripping fillet will put, or help to keep the point on the wire, but of course this is only by the way, as I agree with him in upholding the use of the stripping brush, and I feel pleased to be able to share in his expression on the subject of the card stripping.

REX (R. I.)

Making 30s Warp from 1-Inch Cotton.

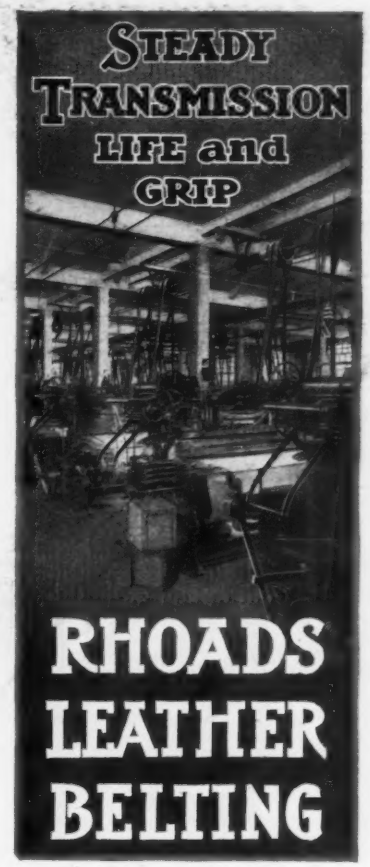
EDITOR COTTON:

Without going back and digging up all the history of the article of "G. S. (N. C.)" in reference to the weighting of top rollers in the spinning room, I would like to comment on a part of the article in which "A. E. S. (Ga.)" answered this, the answer appearing in the December number of COTTON. The latter part of the last paragraph reading as follows: "I find that these numbers do not run very well on a ring larger than 1¾ inches. A 1½-inch ring would be much better for 30s yarn. 'G. S.' will find that he will never make 30s yarn successfully out of 1-inch cotton."

We are on 30.50s warp, and spin some filling as light as 45s out of 1-inch cotton, and our work runs above the average, not the best but above the average, and our breaking strength is right close up to Draper's standard for this weight yarn, in fact, sometimes right at Draper's standard, and this being the case I feel that what I might say will be of some interest to the readers of COTTON.

We use the weights put out by the Saco-Lowell Shops for use on these spinning frames, having a 1⅝-inch ring, 2¼-inch gauge frame, 112 spindles to the side on warp. We use a spindle speed of 9.500 r.p.m., a front roll speed of 112 r.p.m., and 6/0 travelers. But the spinning is not the place altogether to judge where trouble exists. To get at the beginning of how we are managing and arranging our cotton for the mill, it is something like this:

We use the blowing system, and we try to have at least 30 bales of cotton (compressed) with the ties off, aside from what we are running into the blowing system for the picker room. In the picker room we have the automatic distributor over the hoppers (using a Murray cleaning machine between the bale breaker and the hoppers) and be-



A LARGE Carolina mill uses Tannate on looms, spinning frames and winders, and on other drives throughout the mill where they want the best in belting. The report says they will not consider anything else for these drives.

From a Georgia mill comes another report of Tannate on spinning frames. These belts were installed in 1913 and are "still running in good shape."

Belt life is important but frequently the "Tannate grip" is more so. For Tannate often increases output and it is output that most plants are after.

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The life of cotton harness is short, especially when compared with Flat Steel Heddles which last indefinitely and are much more efficient. That they are rapidly replacing the old style cotton harness is shown by testimonials of well-known textile men at recent conventions covered by "Cotton."

J. G. Coman, Supt. of the Mexia Textile Mills, Mexia, Texas, said: "We used cotton harness when we started up, but we found that we got about three months' life out of it. We are now trying to get away from cotton harness and are experimenting with the steel harness."

O. H. Vincent, Overseer of Weaving, Dallas Textile Mills, Dallas, Texas, stated: "There is no stretch to steel harness. It is the same always."

W. A. Black, Supt. Beaumont Mfg. Co., Spartanburg, S. C., said: "On the four-leaf twill we are using the flat steel heddle. It is about the only thing with which we can make the high-count goods satisfactorily."

John Klinck, Assistant Supt. Sibley Mfg. Co., Augusta, Ga., said: "We are making denims, 28-in., 68 x 42, with a 7¾s warp yarn. We were using cotton harness and found a great deal of trouble with it sawing in two, and we have changed to the steel heddle with very fine results."

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lieve it is a regular "Henry Ford automatic" for the front man on the breakers. He has to doff those breaker lappers or the automatic conveyor chokes up, and there is a fuss in the camp. In this way, we get a better production on the breakers, it keeps fresh cotton coming all the time, and when the machines are once set, the same quality is secured all the time and the eveners can be set on the other lappers at will, feeling sure that they are coming this way most of the time. We do not use the intermediate lappers in the picker room. A long time ago I tried the experiment of three processes in the picker room to find which made the strongest yarn, and to save me I could not make the three processes show up stronger, so reverted to the breaker and finisher laps for the cards.

But there came a time when we were called upon to produce a yarn stronger than we were making, using the same class in another piece of goods the customer was taking, so all we did in this case was to put up seven strands of sliver at the breaker and finisher drawing frames, instead of six, and got the desired results in breaking strength.

But getting back to the other question. On the cards we make a 46-grain sliver; at the finisher drawing we make a 58-grain sliver; at the slubbers we make a 1.94 hank roving, and at the jacks or speeders we make a 5.75 hank roving and draw it down at the spinning at about a 10.80 draft on the frames using double roving in the spinning room.

We overhaul all our spinning frames once a year, and the section man goes over his rollers once a month, taking so many frames each week. We use over-size bands according to the wear of the whirl of the spindles, and when tying on, the bander carries a little ball of bees-wax in his hand. When the band is put into its whirl the wax is applied to the band. This waxing of the bands causes them to hold a better contact with the whirl, thus increasing the amount of twist in the yarn per inch and lengthening the life of the bands in a running condiion. It conditions the band so that when it becomes slack it will give way equally and the band will not be so likely to make slack yarn before coming off. Not so long ago we checked on a 12-months' record of just how many warp bobbins had shown up as slack yarn in the spooler room, but I happen not to have the record at this writing. However, it was remarkably low compared with what it had been when not using the wax.

For fear some of the readers will misunderstand why I said "oversized" will say, this was due to the old bands wearing the groove rounding in the "V" shape in the whirls. By increasing the size of the band, it comes in a greater contact on the whirls and increases the twist per inch. All this goes to make the spinning run well and is what we call getting good results from a certain kind of cotton in the spinning.

In my opinion, the greatest reason why some people cannot get good results from 1-inch staple on 30s warp yarn in the spinning is not in the cotton, but in the way it is worked along the route until it gets to the spinning, and then the way the spinning is kept up and run, conditioning the atmospheric controls, etc. Also, the attitude of the help in this department has a lot to do with getting by with a lot of work. T. A. D. (GA.)

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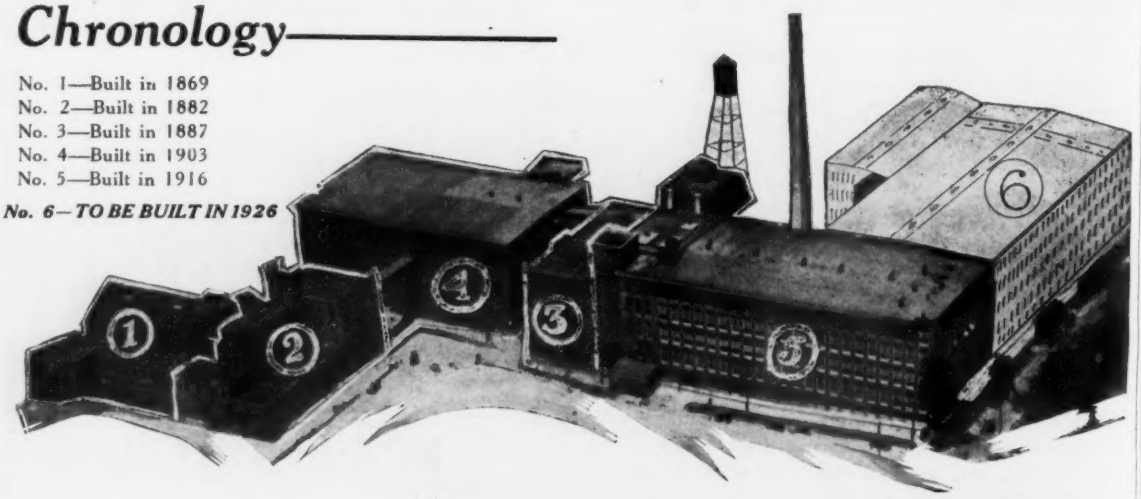

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THE Muscogee Manufacturing Company, pictured above, is a striking example of what may be accomplished under the peculiarly favorable industrial conditions at Columbus. Note the stages of growth by which this has become one of the really large textile plants of the South. The No. 6 mill, sketched into the picture, has just been announced. It is to cost half a million dollars and will be completed during the coming summer.

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EDITOR COTTON:

In his short letter appearing in the October issue of COTTON, "Bob (Mass.)" sprung a good one, and he is right. After noting this letter the reader should turn to page 1273 and read the following statement made by "Experience (Conn.)":

"I claim that anyone should have an opening of at least one week ahead. That will allow the cotton to dry out. I have seen all ways tried and this is the best that I can recommend."

Both of these gentlemen are dead right.

WASH (R. I.)

Figuring the Weights for Top Rolls in Spinning.

EDITOR COTTON:

In the November number of COTTON I note that "G. S. (N. C.)" wants to know whether the middle top rolls on spinning frames should be weighted or not for spinning hosiery yarns 10s to 22s. He is using one-inch cotton for 18s to 30s and 7/8-inch cotton for 10s to 18s. He also wants to know how many pounds the weight should weigh for running 10s to 20s hosiery yarn using the length of staple mentioned.

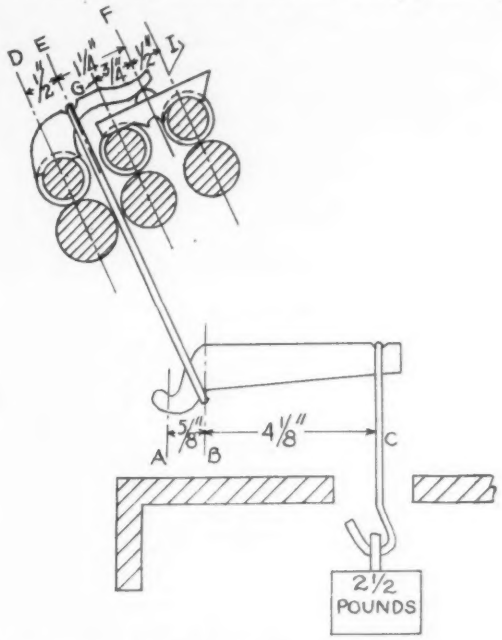
I will first discuss what is commonly called the self-weighted middle roll. In this system of weighting the weight is put on the front and back rolls. The middle roll has no weight on it and depends for the drawing out of the roving fed, on its own weight. It is generally made of highly polished steel and run without covering. This method is generally recommended for long staple cotton where there is not so much twist in the roving to resist drawing out and the rolls can be set properly for the length of staple. The general rule for setting the self-weighted roll is to set on the length of staple, which is to make the distance from center to center of the front and middle rolls 1/16 to 1/8 inch shorter than the length of staple instead of the usual method of setting from 1/16 to 1/8 inch farther apart than the length of staple. Taking it for granted that "G. S." has frames with 1-inch front and 7/8-inch middle fluted steel bottom rolls, it would be impossible to get the correct setting on the 7/8-inch cotton, and I do not believe the setting would be practical on the 1-inch cotton. If "G. S." tries any experiments along these lines I would like to hear from them.

I will now give a few ideas on roll weighting and my experience on 10s hosiery yarn. The conditions which determine the amount of weight necessary for top rolls from a practical standpoint are as follows: (1) The hank roving fed; (2) the length of draft; and (3) the amount of twist in the roving fed. Taking up the conditions in the order in which they are stated: (1) It is a recognized fact that the larger the amount of stock fed to the rolls the heavier the weight necessary to hold it while it being drawn out by the rolls. An illustration of this is the drawing frame where a much heavier weight is used. (2) The more twist put in roving, the harder it is to draw out and the greater the tendency to pull between the rolls without drawing out, making it necessary to put on more weight or ruin the leather covered roll by channeling or grooving it when the hard twisted roving is pulled through it without properly drawing out. (3) The more stock that is drafted the greater the pull on it as it comes from the bite of the rolls, for that reason it is necessary to adjust the weight on the top roll to hold it firmly while it is being drawn out.

I will now give a rule for finding the weight on the front, middle and back rolls. Referring to the diagram: To find the weight in pounds on the front saddle, multiply the weight by the distance A C and divide by the distance A B.

$$\frac{2.5 \times 4.75}{.625} = 19 \text{ pounds}$$

To find the weight on the front roll: Multiply the weight



on the front saddle by the distance E F and divide by the distance D F.

$$\frac{19 \times 1.25}{1.75} = 13.5 \text{ pounds}$$

The weight on the back saddle equals the weight on the front saddle minus the weight on the front roll:

$$19 - 13.5 = 5.5 \text{ pounds.}$$

The weight on the back roll equals the weight on the back saddle multiplied by the distance F I and divided by the distance G I:

$$\frac{5.5 \times .75}{1.25} = 3.3 \text{ pounds.}$$

The weight on the middle roll equals the weight on the back saddle minus the weight on the back roll:

$$5.5 - 3.3 = 2.2 \text{ pounds.}$$

The sketch shown was taken from a frame on which I ran 10s hosiery yarn very successfully.

The distance D E, E F, G H and H I are very near standard for all frames. Therefore, if "G. S." will take the weight of his weight and substitute it in the example for finding the weight on the front saddle for the figures, 2.5, or the weight in the example, and X for the distance A C or 4.75, dividing by the distance A B from his lever, using 19 as an answer and solve for X he will get the length of lever necessary to give the correct weight on the top

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rolls. It may be that all he would have to do would be to buy longer levers. In case the slits for the weight hook are not long enough it may be possible to use a key hole saw on them and make them longer. He can also substitute and get the weight necessary to use with the present levers. It is up to "G. S." to decide whether it will be more economical to buy new weights or new levers.

G. S. T. (GA.)

Bad Spinning at the Mule.

EDITOR COTTON:

There are a great many thing which cause the ends to break during the five stages of the operation of the mule, the five being:

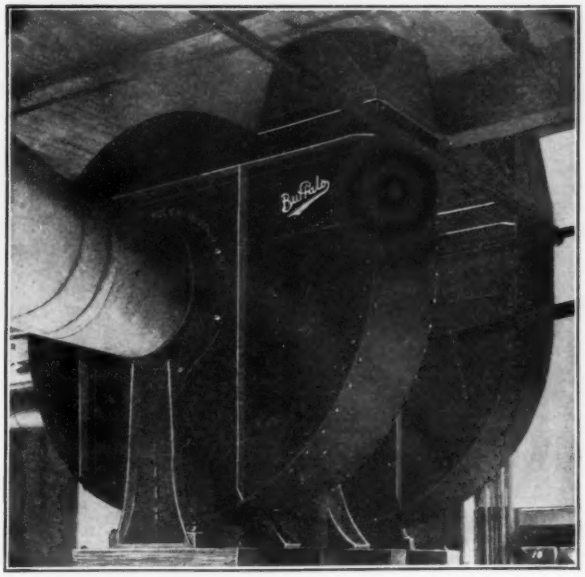
Outrunning of the carriage, twisting at the completion of outrunning of carriage or head twist, backing off, in running of the carriage, and fallers unlocking. The inferior quality of cotton will cause the ends to be broken excessively, whatever care may be taken at the mule. Some improvement may be made by slowing down the mule and putting in twist.

Outrunning of carriage.—Too much "drag or gain" in the carriage over the delivery of the yarn. The roving may be dirty or irregular, rollers dirty or the flutes of the iron rollers and the coverings of the top rollers may be defective. Also the lack of lubrication may be a cause. Wrong settings of rollers, the traverse out of order, causing roving to run off the edge of the rollers. Too much twist will cause the ends to be twisted down if there is an insufficient amount of humidity. Wrong setting of the back shaft at the completion of the outgoing of the carriage. Faulty setting of the change at the end of the stretch.

Twisting at the completion of the stretch.—When the remainder of twist must be put in at the end of the stretch, an insufficient amount of delivery of yarn, by not using right delivery gear, causes breakage.

Backing off.—A great amount of threads will be pulled down during backing off by placing too much weight on the counter faller to secure a hard cop; too severe a backing off by the winding faller wire being pulled down more quickly than the threads unwind from the spindle; the faller wire jumping when the faller locks, by the backing-off chains not becoming slack soon enough, caused by a tardy disengagement of the backing-off click at the completion of the backing-off. Other causes for breaking are defects in connection with the faller, such as the faller wire out of line, faller shafts weak, spindle boards slightly resting on the top of the spindle whorls and stopping the spindles. On weak yarns, if the locking plate is set so as to cause the faller to lock too deeply, it will break yarns.

In-running of carriage.—Too rapid or a jerky inward movement of the carriage, caused by the slipping of the drawing-up friction, or faulty setting of scrolls and scroll bands. Weak carriages, weak back shafts, irregularly built up cops and improper setting of the quadrant causing threads to wind down. Too much nosing motion applied, or not enough belting motion applied. Backing-off friction not completely disengaging sufficiently, thereby pulling the faller down. Loose pulley or pulleys on main shaft becoming heated through lack of oil will pull the faller down. Also if counter belt or belts are slightly working on the edge of the tight pulleys during the backing-off or run-



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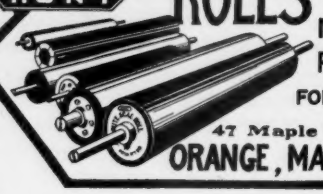

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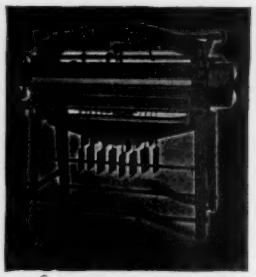

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ning-in of the carriage.

Fallers unlocking.—At this point the greatest breakages are caused by the fallers unlocking too late by faulty setting of the unlocking bracket in order to prevent snarls or kinks being made; irregular setting of both faller wires; and carriages out of square or out of line with rollers. Uneven tension of the winding faller springs, and uneven setting of the back stop will also give trouble.

There are many more causes of bad spinning at the mule, but the above are some of the principal ones.

G. R. K. (MASS.)

Asks Readers to Tell of Help Received.

EDITOR COTTON:

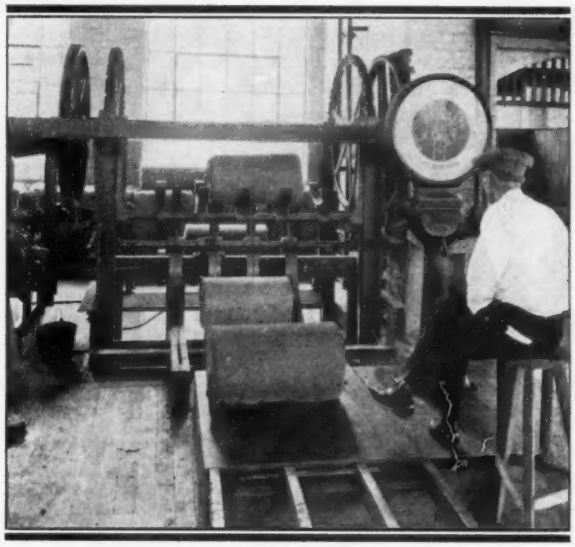
I am going to ask the readers of COTTON to come on and be game, as was "Contributor No. 2619" in his letter in the December issue, in which he says flatly, without any apologies, that the article of "A. M. (Ga.)" appearing in the August number of COTTON, entitled "Why Card Comb Boxes Give Trouble," was the means of his learning something which had been worrying him for five years. That was a wonderful article; it struck me forcibly and made me feel good. It is all very well to go over an article and pick out sentences to criticize when making replies, but for the love of Mike, why can't they be reasonable and have the nerve and good nature to tell the readers when they find something that has really done them good? It makes the contributors feel that they are accomplishing some good and encourages them to come back with something else good on which they have had trouble and overcome it. However, if there is just one endless line of criticism, the contributor will say to himself, "O-helenmary, what's the use, they do not seem to believe what I have told them." Let them come across with the good things that they have been getting out of the articles in this wonderful magazine of ours, and set the woods afire with the bright side of the valuable service received through the medium of COTTON.

There is hardly any end to the help that I have gotten directly from the contributors to COTTON. Several times I have gotten information on problems which I was up against in less than four days after COTTON had received my question. Now, does the reader have to have his head shot off before he can realize what a good thing has been worked up in the "How Other Men Manage" section?

Again I want to personally thank "Contributor No. 2619" for the manner in which he has so cleverly expressed himself in reference to the help which he has received, and somehow I wish I had been the one he referred to.

I feel more interested in the cards (including pickers), which is my hobby. I just naturally take more notice of letters on this subject than I do on most others, as having been through quite a bit of the "tuffs" in working up cards that have been neglected, I have a tender feeling for a man who has carding trouble.

Now, with further reference to the comb box trouble, in short, the reader should get the lost motion out of the bearings in the boxes, tighten up all nuts, keep them clean and use a medium semi-fluid oil, and *should not* "over-oil" them. The bands should not be allowed to run too tight. About one tablespoonful of oil twice a week will keep the boxes in good shape running ten hours per day. Also, the combs should be kept leveled and lined. I have Saco-Lowell



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cards and I do not have any trouble with boxes throwing oil out of the boxes, or hot boxes. However, they will have to be kept right up with, just the same as with any other machine, if good work is secured from them. There is no such thing as starting a machine up and going off and forgetting about it if it is desired to get good results continuously; a man would not make a garden in that way, but would keep on pegging away at it every chance he got, knowing that the better it is taken care of the more he will make out of it. Machines need even more attention than do gardens, for nature does half the work in a garden; not so with a machine. Then, too, as "Old Timer" says, we should ask ourselves if we are attending to the machines as we would have others do if they were ours—to be honest, hardly so. T. A. D. (GA.)

Spraying Oil on Raw Cotton.

EDITOR COTTON:

It may interest some of your readers who are spraying, or thinking of spraying their cotton with oil, to know that this is not an entirely new practice, as many believe. In talking with men oiling, or interested in oiling cotton, I have heard the credit for originating this practice awarded to so many different mills that I would like to say that I recently saw a plant where they had used oil on cotton for the past fifteen years. I understood the manager of the mill to say that he had brought the idea from Germany, where it seemed to be a very commonly used plan.

This mill used more waste than cotton, and their cotton was all very low grade stuff. On poor waste, they had been in the habit of sprinkling oil in the hoppers, using an ordinary broom for the purpose. The broom would be dipped in a bucket of oil, and then banged over the edge of the hopper, producing a good shower of fine particles of oil. With every load of waste put in the hopper would get a dousing of oil, and while the results would probably not be as uniform as where a pressure-operated spray head is used, they seemed to get along very well. This mill man made the same claims for the oiling that are now advanced by others on his class of work, saying that it kept down dust and fly, and made their waste work run better all through. He did not seem to think much of the idea of using oil on good cotton, however, and did not use it on what little cotton he ran.

The present extensive interest in the spraying of oil on cotton seems to have originated in the excellent results obtained by one mill in experiments in oiling dyed and bleached cotton to restore the natural oil removed in dyeing and bleaching. I have talked with a good many men using it, and the concensus of opinion was that it was good practice on waste, or on dyed or bleached stock, but of very questionable value on good cotton. Much depends on what a man is making. Most of the men I have heard favor the oil were on coarse low, or medium grade goods. Those opposed, on fine, high grade work. Men running 1 1/16-inch or better, in Middling or higher grade, seemed to think oiling entirely unnecessary, if not actually objectionable. Several men on this class of stock came out strongly against anything that would interfere with getting out all possible fly and short stock, as well as all the dust.

On low-grade stocks, as well as on dyed and bleached work, anything that will overcome the dryness and dustiness of the stock ought to be a help. One superintendent of a large plant on ladies' dress goods said that about the only thing he could say for the oil was that it kept down static and made a little less fly about the cards, and he was on colored work, too. Another man, also on colored work, but using low grade cotton, was most enthusiastic about oiling the stock.

So, those of your readers who have tried this oil spray with unsatisfactory results may be interested in what I have said as to the experiences of others, while those who have not tried it, but are thinking of doing so may get a little help in deciding whether their work will be benefited.

B. W. (MASS.)

Preventing Slack Ends at the Slasher.

EDITOR COTTON:

Having just read the article by "J. F. L. (Ala.)" on slack yarns on warper beams, which appears in the December number of COTTON, it brings to my mind a similar trouble which I had some few years back on the slasher. We did various things, including paying attention to the friction on the warper beams behind the slashers, all of which we thought helped a bit. However, one day a warper tender called our attention to the slack spools in the creels, saying "just watch those spools, how the ends bag down and some of them run tight." Now when the ends run slack the ends on the warper beams will be the slack ends on the slasher creels and the ends that run tight will be the tight ends on the back of the slasher creels. Now as to the remedy. A friction should be placed on the incoming threads from the spools in the warper creels before the beam has control of the individual ends in the winding up of the threads onto the beam.

If there are cast iron or steel steps in the warper creels it is pretty hard to handle, but at least the friction can be put on the slack ones. If there are glass steps it is an easy matter; friction can be placed on them that will govern them almost all alike. By wrapping the roller prior to the ends going over the "rise-roll" it takes care of the threads when the warper stops. This will take that tension effect up and cause them all to be very near the same tension and smoothness on the surface on the beams.

With the gearing on the warpers all set up and working freely, and another rigging that we added on our warpers, the foregoing remedy helped us considerably. Another thing was to put on the end of the top cone a spoke balanced wheel that weighed 12 pounds. This caused the warpers to stop smoothly and to take care of the kink that often forms when a warper stops suddenly, especially if over speeded. Good spooling, though, will aid a lot in the stopping of the warpers, but we all have stoppages. The things to do is to control them the best we can when we do have them.

The foregoing remedies will aid some, and I hope that "J. F. L. (Ala.)" will at least try a few of them.

T. A. D. (GA.)

Ray T. Johnson, Chicago representative of Callaway Mills, is now located in the new Fabric Building, 325 South Franklin Street, Chicago, Ill. His former address was 226 West Adams Street.

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Hosiery Dyeing

BY M. N. CONKLIN.

The manufacturing of cotton hosiery is the most important branch of the industry. Within the past few years as in every industry, the hosiery trade, prompted by the insistence of the individual buyer has demanded a better grade of goods, a better wearing hose. Hosiery that developed holes after one wearing would no longer be tolerated, and the manufacturers immediately began an investigation and carried on various experiments to meet requirements. These experiments led to the development and use of two groups of dyestuffs never before employed in the dyeing of cotton hosiery, so that at the present time there are three distinct groups of dyestuffs for producing blacks on cotton hosiery—aniline black, developed blacks, and the sulphur blacks.

Aniline Black.

A description of the dyeing process with the use of aniline black will show wherein lies the trouble in the application of this dye, for it is undoubtedly true that if the process is properly and very carefully carried out, a beautiful, intense black, possessing remarkable fastness to light and washing is obtained.

Aniline black is obtained from aniline oil or aniline salt by means of oxidising agents. The aniline salt, as white as possible, is preferable for the production of a good aniline black. In the preparation of the aniline liquor it is essential that the bath be made up in such a manner as to keep a fair length of time in order to prevent the premature formation of aniline black. To effect this the aniline salt is mixed on account of its great solubility. To this mixture is added a solution of sal ammoniac, if the goods are to be singed, but alum, if the goods are to be lisled. Lastly a solution of copper sulphate is added.

The sal ammoniac serves the purpose of a hydroscopic salt while the copper sulphate acts as the oxygen carrier. All these ingredients should be dissolved in as little water as possible. In some cases aluminum acetate is added to avoid tendering of the goods, by neutralizing the hydrochloric acid formed in the subsequent ageing process.

The goods are entered into the bath and well saturated with the aniline black liquor of about 12 degrees Tw., hydroextracted and then carried to the ageing or oxidizing room. A uniform temperature and humidity must be maintained throughout the ageing room. Wet and dry thermometers should be used to determine exactly the temperature and moisture conditions. When the goods are entered they are grayish white, which during the process change to a light and finally to a dark green color.

The Ageing Process.

The temperature of the ager, after the goods have been entered, should be raised to 94 degrees F. As soon as the goods dry the ageing process sets in. The steam, as moist heat is required for the ageing process, is turned on until the dry thermometer registers 94 degrees F. and the wet one 86 degrees F. The goods are left in the ager under these conditions for six to eight hours. They are then taken out and allowed to cool on the floor, or better, on wire frames. When dry they are chromed and softened. In the chroming process it is advisable to use some sulphuric acid with the chromate of potash to prevent the development of a rather reddish shade.

The following is a practical formula which has given good results. However, as conditions vary in different dyehouses this cannot be taken to hold for all conditions:

Solution A. Dissolve in water
116 pounds aniline salt
8 pounds starch, and make up to
50 gallons.

Solution B. Dissolve in water
29 pounds chlorate of soda
15 pounds alum
4½ pounds blue stone, and make up to
50 gallons.

In the above formula 120 pounds of aniline salt may be substituted by 85½ pounds of aniline oil and 11 pounds of hydrochloric acid, 32 degrees Tw. Eighty-seven parts of chlorate of soda are equal to 100 parts of chlorate of potash. The latter is not as soluble as chlorate of soda and crystalizes out from the dye liquor more easily. Bichromate of soda and bichromate of potash have the same oxidizing power, but the soda is more soluble than the potash salt.

The Greening of Aniline Black Dyed Hosiery.

After the aniline has been oxidized to a green shade, the black color is developed by a further oxidization with bichromate and acid. When the goods are chromed at a low temperature, the black is again reduced to emeraldine, or in other words, it turns green on exposure to light and atmosphere. The padding solution is made up of equal parts of solutions *A* and *B*. There should be enough padding solution in the machine to insure thorough impregnation of the material. The goods are padded for thirty to forty-five minutes. Then they are extracted until they retain padding solution equal approximately to 75 per cent of their weight. The goods are then placed in trucks and covered with burlap.

The padding solution is brought to its original volume with equal parts of solutions *A* and *B*, and the next lot can be run through. The next morning the goods are oxidized at 120 degrees F. for three and one-half hours with closed ventilators. The ventilator is opened and the temperature lowered to 105 degrees F. at which temperature the goods are lisled for five hours. Chrome the next morning with 6 per cent of bichromate and 1 per cent of sulphuric acid at 170 degrees F., rinse and soap.

If it is desired to singe the goods, it is not necessary to use starch in solution *A*, and the goods should be oxidized for about four and one-half hours. In a small dyehouse, the goods may be tom-tomed, oxidized, and lisled the same day, but the above formula gives a good method for a plant which is in operation every day.

The following formula can be used when the goods are to be singed:

Solution A. Dissolve in water
120 pounds aniline salt and make up to
50 gallons.

Solution B. Dissolve in water
5½ pounds blue stone
32 pounds chlorate of soda

4 pounds ammonium chloride
4¾ gallons acetate of alumina (15 degrees Tw.), and make up to
50 gallons.

Pad with equal parts of solutions *A* and *B*, oxidize at 110 degrees F. and chrome with 6 per cent bichromate and 1 per cent sulphuric acid for 20 minutes at 170 degrees F.

Chroming at an elevated temperature insures a black which is to a certain extent ungreenable. An absolutely ungreenable aniline black may be obtained by using the ungreenable aniline salt, which is toluidine hydrochloride, a homologue of aniline salt. Ungreenable aniline salt on hosiery should be used in the proportion of one part to three parts of aniline salt. A properly dyed aniline black will not turn green under the influence of acid. The goods will gain from 5 to 10 per cent in weight. They will also acquire a peculiarly compact feel.

This greening of aniline black which has often proved to be such a source of trouble is due to oxidation. Another complaint is the tendency to crock or rub off, but this happens only in dyed, not in the oxidized and aged blacks. The bronziness often noticed in black hose is due to over-oxidation and can easily be counteracted by means of some reducing agent. But the tendering of the cotton fiber is the most serious of all faults of the aniline black dyed goods; the complaint which led to the use of other dyes for cotton hosiery.

Tendering of the Cotton Fiber.

The tendering of the cotton fibers is apt to take place in the ageing and lisling process, and the goods require very skillful handling to bring them out in a perfect condition. This perfect condition can only be obtained by exercising the utmost care throughout the entire operation, especially in the preparation of the aniline black liquor. The trouble begins in the lisling process which is actually a prolonged ageing. Lisling is for the purpose of producing a good smooth finish on the goods as it takes off all the nap, but very often it is the finish of the goods, as the more the fiber of the nap is weakened the more the thread itself is attacked by free hydrochloric acid. In some instances the goods are carbonized and thus absolutely worthless. It is almost impossible to remove the nap without tendering the fiber and if the nap is not removed; that is, if the goods are not lisled, they must be singed after leaving the ageing room.

The theory of the lisling process is that when the treated fiber is dried the loose fibers on the outside become brittle and break off by contact with the sides of the wire drums. To enhance this lisling process the drums are provided with a slow and a fast gear. In this way the goods can be oxidized at a low speed and lisled at a high speed.

It has been due to these difficulties in the dyeing of cotton hose with aniline black that led to the search for other dyes for hosiery. The direct blacks proved unsatisfactory because of their lack of fastness to washing and also to their inability to give a full and intense shade. Much better substitutes were found in the diazotisable or developed blacks. While the dyeing of diazotisable blacks is rather a complicated process, very satisfactory results as regards fastness to washing, to light, beauty of shade and the stability of the color on storing are obtained, but in addition to these advantages the great cause of complaint of the individual buyer was overcome, the tendering of the fiber.

Developed Black.

The dyeing with these blacks consists of three distinct operations: first, the dyeing; second, the diazotization, and third, the developing of the color on the fiber In the dyeing operation the goods are dyed in the same manner as when using direct colors. After dyeing the goods are rinsed with cold water and are then ready for the diazotizing bath. The diazotizing bath is prepared by dissolving sodium nitrite in cold water. To this solution is added the acid—either hydrochloric or sulphuric. By this means nitrous acid is formed which transforms the color on the fiber to a diazo compound which may be developed.

The diazo compound thus formed is very unstable, which necessitates keeping the bath cold—60 degrees to 70 degrees F. It is also very sensitive to light and must be protected from the direct sunlight. The diazotization requires from 15 to 20 minutes. The goods are then rinsed in cold water after which the color is ready for developing. This is effected by treating the goods for 20 minutes in a cold bath made up of meta-toluylene-diamine and soda ash.

The developing process increases the fastness to washing and acids, the intensity of the shade, in fact, it is necessary to develop to produce the black shade. By this method the strength of the fiber is absolutely unaffected; the finest of hosiery, laces and like materials may be dyed by this method without impairing the strength of the fabric.

A few precautions, however, should be observed in this method of dyeing. The use of brass or copper fittings should be avoided when hydrochloric acid is used or streaks, blotches and uneven dyeing will result.

The diazotizable black was the first group to be used to any extent after the aniline black, and in spite of the complication of the process its use has been very widespread and in the majority of cases has replaced the older aniline black method. However, the intricate method of application led the dyestuff manufacturers to further experimentation with the result that the sulphur colors were discovered as applicable to cotton knit goods.

Sulphur Blacks.

The discovery of the sulphur black for cotton hosiery has practically revolutionized the cotton hosiery industry because of the simplicity of dyeing, cheapness, beauty of shade, excellent fastness to light and washing, saving of time and labor in handling and also the excellent wearing quality.

When the use of sulphur black was first suggested for the dyeing of hosiery, as with every new process, much adverse criticism was heard. Some manufacturers claimed they could not produce a good finish, others that the shade was poor and the goods were left too harsh in feel, and still others would not adopt this method of dyeing, claiming that if everybody dyed with sulphur black the market would soon be clogged with hosiery that would never wear out and they would have to go out of business. Of course many of the complaints were justifiable, as sufficient experimentation and information on the subject was lacking, but today the process has been perfected to such a degree that there are sulphur blacks that can be dyed just as easily as the direct colors.

Methods of Dyeing.

In making up the dyebath for the dyeing of cotton hosiary with sulphur black there are a few precautions which should be observed. The sulphur colors should never come in contact with copper vessels on account of the copper be

ing severely attacked by the sulphide of sodium contained in the dye liquor, copper sulphate, a very active oxygen carrier, being formed, which often causes the dyeings to show up red, or bronzy spots to develop. The fastness to washing and to crocking is also impaired if the dye is permitted to come in contact with copper. However, after the goods have been dyed and thoroughly washed the copper is not acted upon by the dyed material and they may be hydro-extracted in a copper cage.

To effect the most efficient dyebath, usually the soda ash is added first and boiled up, after which the sulphide of soda is added and subsequently the dyestuff. The function of the sulphide of soda is to dissolve and to keep the dye in solution during the dyeing. In this connection we might mention the necessity of using a very high grade of sodium sulphide as many bad dyeings have been traced to the use of a poor commercial grade of this salt. After the bath prepared as above has been thoroughly boiled the salt, either in the form of common salt or glauber's salt, is added and the bath again boiled until it is absolutely certain that the ingredients are all dissolved. The dyebath is now ready and the hosiery may be entered dry and the dyeing carried out just below the boiling point, 195 degrees F.

To effect the best results the dyebath is held at this temperature for about 20 to 30 minutes. The steam is then shut off and the dyeing continued for from 30 to 40 minutes longer in the cooling dye liquor. The length of time to complete the dyeing should not exceed one hour.

Sodium Sulphide Cause of Bronzy Spots.

The hosiery after dyeing should be thoroughly washed as quickly as possible. This is essential as it is imperative to remove all excess of sodium sulphide as hot sulphide of soda when exposed to the air quickly oxidizes, resulting in the formation of bronzy spots. Also it will, if left in the goods, slowly oxidize in the presence of air and moisture to acid salts of sulphuric acid which will eventually cause tendering of the goods. It is due to this, that trouble with sulphur black dyed hosiery is experienced. However, if thorough washing has removed all traces of this salt, no complaints will be made. Goods that have been thoroughly washed free from sodium sulphide have been examined after years of storing and have been found to possess just as great strength as on the day they were packed.

Hosiery dyed by the sulphur black method may be singed in the gray or after dyeing. As a rule, when hosiery is singed in the gray, the goods are dyed, washed thoroughly and soaped before removing from the dyeing machines. In this connection it must be borne in mind that a better finish is secured and likewise a fuller shade of black when the goods are aged for at least a day after dyeing, then dried, singed and softened.

Singeing of Hosiery.

After dyeing the goods must be thoroughly dried. The dryer used must be of such a nature as to ensure perfect circulation of the heated air through the hosiery as during this drying the shade undergoes a further development, coming out fuller and somewhat redder. Consequently if an even temperature is not maintained or is too high an unevenness of shade results. This unevenness is partly covered up in the softening bath, but economy and efficient work should aim at a perfect product and not at the necessity of covering mistakes of one step in the next.

Softening of the Goods.

The softening of the hosiery plays an important part as it is here that the final appearance of the hose is made or broken. The first requisite to good softening is a good pure water. Hard water should be avoided as it consumes soap, forming and depositing on the goods an insoluble soap. If it is necessary, due to natural conditions, to use a hard water it should be corrected chemically in a softening plant, of which there are several types in existence, the zeolite process being the one best recognized.

Softening is usually done at a temperature of from 120 to 130 degrees F. for 15 to 20 minutes. There are a good many softeners on the market and it is the dyer's business to select the best for his particular purpose. Many softeners are sold under various meaningless trade names and should be thoroughly investigated and analyzed before use, as in many instances they may do more harm than good. All good softeners are emulsions of soaps, alkalies and oils. The best softener is an emulsion of neutral soap and some oil of vegetable origin. Sulphonated oils, such as Turkey-Red oil or Alizarine oil, do not produce the desired effect, as these oils will not have the same beneficial influence on the shade of the black as a vegetable oil proper. Care should also be taken not to use too large a quantity even of the vegetable oil as the paper bands and boxes in which the hosiery is subsequently packed will be stained on storing. In the case of mercerized hosiery the softening process is often omitted in order to retain a certain amount of the silky scroop. To better emphasize this quality the goods are treated in a rich soap bath at about 100 degrees F. for a short time. They are then hydro-extracted and entered in a bath containing some organic acid, such as acetic, tartaric, lactic or citric, and sometimes a small addition of tannic helps to produce this silky scroop.

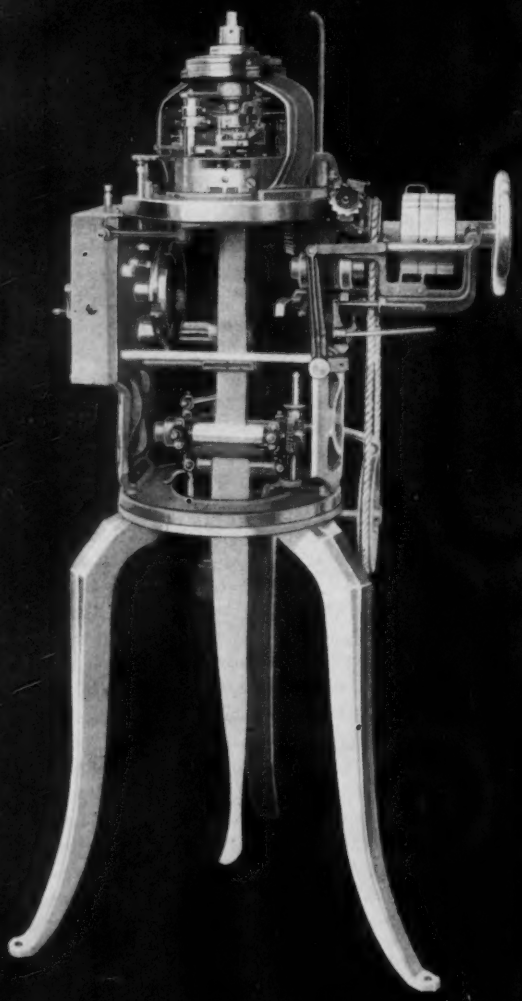
In starting a fresh dyebath a rather high percentage of dyestuff is required, no matter whether sulphur black of single or double strength is used. However, after the first kettle has been prepared the amount of dyestuff required for the standing kettle is just one-half that required in the beginning. There are sulphur blacks of varying degree of solubility and a fairly soluble one should be chosen as the more soluble the dyestuff the less will be the amount of sodium sulphide required.

In keeping a standing kettle, the bath sometimes gets "sick" and will not work properly and the black becomes bronzy and red without any apparent cause. In this case the dyer must use his best judgment as to what to do. The trouble can usually be found in one of the following three conditions: The density has grown too high from the unnecessary addition of salt or from other sources; an insufficient amount of sulphide of soda is being used to keep the dye in solution; or the dyeings are not being sufficiently washed in order to remove the excess of sulphide of soda. If after all these conditions have been remedied the dyeings are still not up to standard, there apparently is no alternative; a fresh dyebath must be prepared.

Determination of Density.

The dye liquor should be maintained at the same density as the freshly prepared bath. To do this the Twaddle meter is used. The dye liquor should be Twaddled at about 195 degrees F., not at the boiling point as the Twaddle meter will register too low at such a high temperature. The den-

(*Continued on page* 405.)



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Asks for Points on K Hosiery.

EDITOR COTTON:

I am about to begin the manufacture of staple styles of hosiery, silk, rayon and mercerized ladies' semi-fashioned, to be made on Scott & Williams Model K 3½-inch 240-needle machines.

I would be pleased to receive suggestions from the readers of COTTON who have had experience with this type of machine or others, what they have found through their experience as to the cost of the manufacture of this product without injuring the quality. The best yarns available are to be used in these products.

For instance, in the machine operation how loose a hem can be made? How tight an ankle can be produced without getting in trouble with reference to other parts of the foot? How plain a slack course should be made and how long a trimming?

Any other suggestions which may occur to the hosiery men answering this inquiry will be much appreciated by the writer, and I am sure will also be appreciated by other readers of "Knitting Kinks." CONTRIBUTOR No. 4353.

Setting Sinkers and Double Sole Plaiting.

EDITOR COTTON:

This is my rule for setting the sinkers on Scott & Williams B-5 machines: I first set the sinker cam to bring the throat of the sinker about middleways of the needle at its furtherest point in. Then I set the bumper so as not to have less than two sinkers all the way in when the head of the needle is level with the brass coming up.

This answers the first part of the question of "R. M. (Ga.)" in the September issue of "Knitting Kinks." He said he wanted a rule for setting the sinkers so as to eliminate hole cutting in the gore and cutting out in the heel and toe. I have found that the rule given will keep me away from this trouble.

He also said he was having trouble in getting the double sole to plait on the edges where the double sole yarn goes in and out, as the cotton yarn comes on the outside more than the artificial silk. This has given lots of us more trouble. A man can't afford to have much friction there coming in, and the yarn naturally is a little loose, which makes it fail to plait properly; but I have not had much trouble when it is coming out. To make any suggestions as to his double sole finger would be a risky undertaking, as he will have to adjust this himself. However, I do know that if he is running the artificial silk yarn in the No. 2 finger, this will add to his trouble. But if he will put it in the No. 4 finger, and use the proper finger, it will divide his yarn enough so that his leg yarn will pull in under the double sole yarn and leave it on top and throw the cotton yarn on the inside. F. S. D. (GA.)

Treating Dyed Silk Before Plaiting.

EDITOR COTTON:

We are manufacturing ingrain fancy goods in which we have been using rayon and mercerized making vertical stripes by reverse plaiting.

We wish to make a new number in which we will use Japan silk plaited on rayon and wish to have the Japan silk dyed before knitting.

We would like to have advice as to how to treat the Japan silk after it is dyed so that the strands will hold together and that it will run properly on the knitting machine. CONTRIBUTOR No. 4345.

A Payroll and Production Record.

EDITOR COTTON:

Of course every man has his own way of doing things, and local conditions, kind of help, size of plant, and things like that determine whether he can use the exact forms or systems that another fellow in a different plant uses with satisfactory results. At the same time I feel it is of interest to learn of what the other fellow does, and how he does it. We all are a product of what we read, see, and hear, but we must take everything that we read, see, and hear and apply to it the leaven of our own reasoning, to see what part of it will fit in with our own conditions. Therefore, the more information a man has to draw from, the more background he will have, and the more experience. I don't see why your "Knitting Kinks" department should not prove a very valuable aid to the knitting mill man in helping him out of troubles, and keeping him in touch with the other fellow's ideas.

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DEPT. DATE TO

	Name				No.	Name				No.	Name				No.	
Day	Dozen	Hours	Deduction Work	Deduction Etc.		Dozen	Hours	Deduction Work	Deduction Etc.		Dozen	Hours	Deduction Work	Deduction Etc.		Dozen
Mon.																
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Wed.																
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Fri.																
Satur.																
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Totals																
Rate																
Amt.																
G. Amt.	$					$					$					$
Ded.	$					$					$					$
Net Amt.	$					$					$					$

	Name				No.	Name				No.	Name				No.	
Amt.																
G. Amt.	$					$					$					$
Ded.	$					$					$					$
Net Amt.	$					$					$					$

ALL ERRORS IN TIME MUST BE REPORTED ON DAY TIME IS REPORTED
No Corrections Will Be Allowed Unless Error Is Reported Promptly

I don't know whether the plan we use for keeping a record of production, and making up our payroll, will be applicable to many other plants or not, but I thought I would tell your readers about it, thinking possibly it might contain a suggestion for some of them—especially those who are just starting in without any true-and-tried methods of their own.

The accompanying illustration gives the idea of our plan. These forms are made up on sheets measuring 14½ by 12 inches, so that the two-weeks' record of twelve operators (three being shown in actual size, to save space) may be placed on one sheet. Then enough sheets to cover the operating force of the department may be used.

These records are posted within a locked glass case in each department. They are fastened to boards with thumbtacks. Each evening the foreman takes the boards to his desk, and enters the production of each operator on the sheet. Thus the next morning each operator can see just how much work he or she is credited with, so that if there is any complaint to be made, it can be entered promptly, and any necessary correction made.

You will note there is a column headed "Dozen," and the next headed "Hours." The second column is used for instances where we might want to take an operator off of piece work and put her or him on day work, and this enables us to keep the record straight on this score.

Under the column headed "Deductions," we make a deduction of 15 cents per hundred menders, or deductions in proportion, thus 50 menders would cost the operator 7½ cents. This of course by no means repays us for the spoiled work, but it is done to let the operators know careless work will cost them something, and to let them know we are watching what they are doing.

In the left-hand margin of these sheets are punched two holes so they may be filed in loose-leaf books as permanent office records of payroll and production.

R. D. S. (TENN.)

The New York offices of Stein, Hall & Co., Inc., have been removed from 61 Broadway to the new Murray Hill Building, 286 Madison Ave., where the entire 21st floor will be occupied, it is announced.

Number of K Machines per Knitter and Fixer, and Points on Needle Breakage.

[Editor's Note.—A correspondent recently asked "Knitting Kinks" the following questions: On a lay-out of about 250 Model K Scott & Williams machines, what is considered the proper amount of help as to operators, apprentices, and fixers? How many machines should each handle? What is the method used as to needle breakage, that is, what is done to keep this item as low as possible?

The opinions of seven executives of as many different mills, stating their practices in answer to these questions, are given in the seven replies in the following paragraphs. As pointed out in several of these letters, the number of operatives depends upon the class of work as well as the gauge of the machines. Since this was not specified by the inquirer, each man replying has given his practice so far as his own conditions are concerned. Thus the compilation of answers covers a larger field in presenting the different methods in use under various conditions. The replies follow:]

EDITOR COTTON:

In reference to the number of operators required to handle 250 Scott & Williams K machines, will say this is largely regulated by the gauge of the machines and the kind of goods being made on them. For instance, we have 132 200-needle, 3¾-inch machines making mercerized work. Each operator on these machines handles either 26 or 27 machines, and we have one fixer on 53 or 54 machines; we also have a fixer learning, who is keeping up 27 machines.

Now, we have 100 260-needle, 3½-inch machines making plaited work, and on these machines one operator handles 20 machines, and one fixer cares for 50 machines. We also have one learner on knitting whom we teach to hunt for needle streaks and test the machines out for plaiting defects. So you see that the grade of goods being made, and the gauge of the machines used, determines the number of machines each operator can handle.

As to the second question, with reference to how we record our needle breakage and keep it as low as possible, we issue so many needles to each fixer in the morning of each day, and charge them to him, and any additional needles he requires for that day are also added to his account. This account is kept by the month, and at the end of that time, the fixer is given a report as to his production and the number of needles used, showing how many dozen were knit per needle. This generally runs, on our 200-needle machines, about three dozen per needle, and on our 260-needle machines, about 1½ dozen per needle. This last is rather high, comparatively, as on silk work a needle must be taken out if the rivet becomes the least bit rough, when the same needle would continue in service on mercerized work and not be noticed in the finished fabric. If our reports show a fixer's needle breakage to be abnormally high, the boss knitter and myself—the superintendent—usually investigate, and if the trouble is in the machines we take steps to remedy it. CONTRIBUTOR NO. 4322.

EDITOR COTTON:

Answering the query regarding the necessary amount of help to take care of 250 Model K Scott & Williams machines, this depends entirely upon the character of the machinery, the class of merchandise produced, and the kind of materials used. The same thing would apply to needle breakage, seconds, etc.

However, I would say, generally speaking, that no new concern would be interested in launching out today with K machines of less than 240 needles on 3½-inch cylinders, and very likely, 260-needle. These machines, I naturally suppose, are to be on rayon or pure silk, and if on ladies' hosiery, I would consider a good fixer for every 50 machines, and a good knitter for about every 18 machines, to be about the proper amount of help for the actual operation of the knitting machines. Knitting machines such as we are considering will produce about 2¾ to 3 dozens per day of ten hours, depending on the kind of goods. A good average looping production for 240- and 260-needle goods is 50 dozens per day. Therefore, one looper should take care of the production of 15 to 18 knitting machines. Menders and seconds in a well-regulated knitting room should not exceed 6 per cent, and a good mender should take care of the production of 100 to 125 machines. This is based on the knitter being paid for perfect work, and separating the perfect from the imperfect, and the mender mending imperfect work only.

Such a room as we have under consideration would naturally need one high-class man for foreman, and one good head-fixer over the other fixers is entirely advisable. In addition to this, another man or two would be needed for such jobs as sweeping, looking after yarn, etc., which would about complete the list of help required for a strictly seamless stocking knitting room of 250 K machines. Different mills have different systems, some preferring the back-seaming attachment on the machines, others putting in the mock seam with sewing machines, all of which has considerable influence on the amount of operatives required.

Regarding needle breakage, this is a matter that can be determined only by long experience and good judgment. The hazard of bad yarns and faulty materials in needles are factors which must be considered, and the man in charge of the room must be familiar with all of the different conditions of needle breakage. My own system is to give each fixer 50 machines and keep strict account of all supplies used, including needles, and show them a monthly statement of their maintenance account. This creates a kind of friendly rivalry and comes as near keeping needle breakage to a minimum as any system with which I am familiar. CONTRIBUTOR NO. 4323.

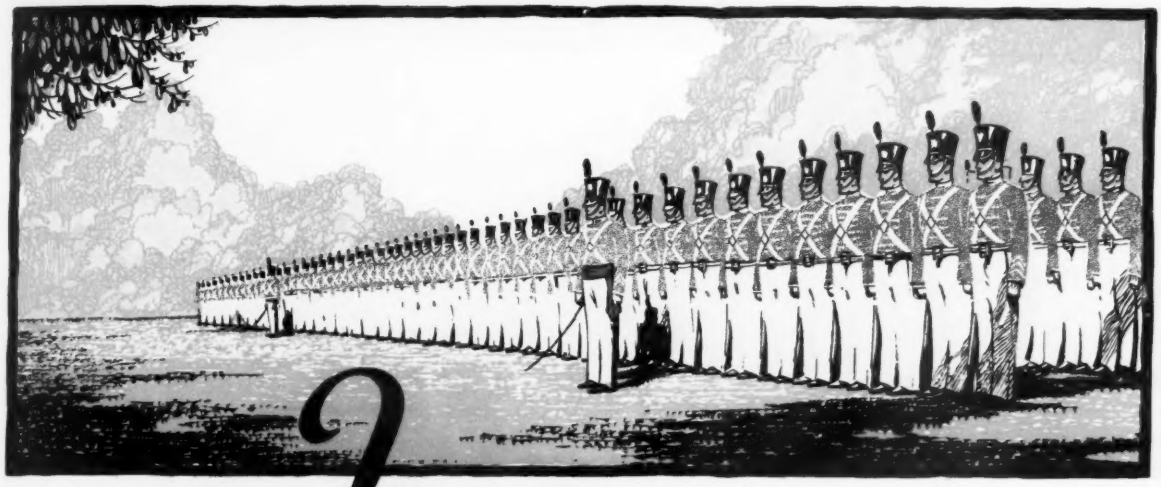
EDITOR COTTON:

I note the inquiry with reference to K machines does not specify the needle or gauge of the machines. However, I will assume that a 220-needle machine on mercerized yarn or rayon is what you have in mind.

One knitter can operate 20 of these machines and cut the double sole from the work. About 50 machines is what one fixer can handle and keep the machines in nice shape. I also think it advisable to keep at least one apprentice on as many as 250 machines, so there will be at least one fixer in training all the time.

Now as to the needle breakage, I think it a good idea to charge each fixer with the needles, sinkers and transfer bits he uses and have a complete understanding with him that his salary will depend on the amount of machine supplies he uses and the amount of seconds and waste he makes on the machines that are in his care.

Of course, if a finer gauge machine is used, and plaited



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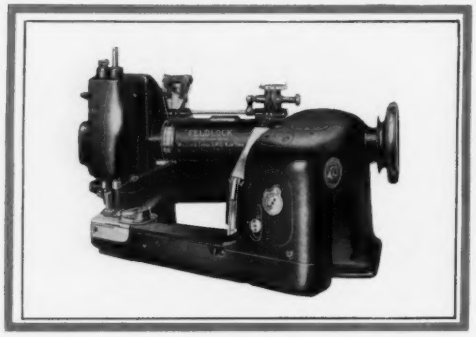

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work is made, the operators cannot handle quite so many machines as I have stated and keep them in good shape.

CONTRIBUTOR NO. 4324.

EDITOR COTTON:

In one of our plants we operate 270 Model K machines, 240-needle, 3½-inch cylinder. On this lay-out of machines we use one head fixer, five fixers, one apprentice and fifteen knitters.

In regard to needle breakage, each fixer keeps a supply report, keeping account of this item.

CONTRIBUTOR NO. 4325.

EDITOR COTTON:

I honestly do not observe any set rule that would apply to all mills operating Model K machines. It depends on the gauge of the machines and the quality of goods being made. If a mill is running coarse goods, 176- or 200-needle, an operator can attend to a great many more machines than if the mill concentrated the machines on 260-needle work, silk plaited. For this reason, I would hesitate to recommend anything in the way of a lay-out for the machines mentioned.

Of course needle breakage also depends on the class of goods being manufactured and the quality of yarn used. Another thing, needle breakage varies with the ability of fixers to take care of the machines. In order to keep needle breakage down and the quality of the goods up, we make daily reports on production, percentage of seconds and number of needles broken, and check this from day to day.

CONTRIBUTOR NO. 4326.

EDITOR COTTON:

If I were going to allot operatives for 250 K machines, I would say that on this number of 240-needle machines, I would want ten *good* knitters, and have a fixer for every 40 machines. On 260-needle silk work, I would give only 37 machines to the fixer; while if it were 220-needle work, I believe a good fixer could look after 50 machines.

CONTRIBUTOR NO. 4327.

EDITOR COTTON:

In reference to the number of fixers and operators for 250 Model K machines, this of course is determined by the gauge of machine and class of work. For 240-needle and 260-needle machines, on artificial and pure silk, my rule is to allot 35 machines to the fixer and 24 machines to the knitter. I know mills which give the fixers more machines, but I do not believe in overloading them.

On H-H machines, we have 20 machines to the knitter and 30 machines to the fixer.

CONTRIBUTOR NO. 4328.

The modern executive recognizes the important element represented by the long-distance telephone in present-day communication. It is interesting, therefore, to note that the 1926 construction program of the Long Lines Department of the American Telephone and Telegraph Company contemplates plant construction to cost more than $28,000,000, with the view to providing increases in long distance telephone traffic and making possible more dependable and faster service. Long distance cable facilities are the largest single project of the construction program, representing an expenditure of 11,200,000.

A Money Saving Device for a Folder.

EDITOR COTTON:

The accompanying sketches illustrate a simple arrangement which has meant dollars in saving to our mill, which is an underwear knitting plant.

In Figure 1 will be noted the usual "spreader" which is used on the automatic folding machine. On the right hand

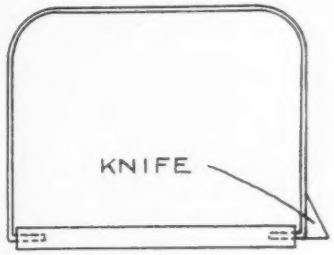


FIG. 1

side of this I welded a little sharp knife, as indicated. As the tubing for cuffs runs down over the spreader, this knife cuts the fabric at the fold, automatically.

This, as will be recognized, eliminates one operation of the man with the electric cutting knife in the next process,

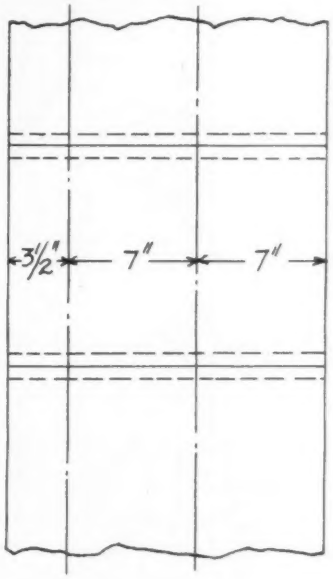


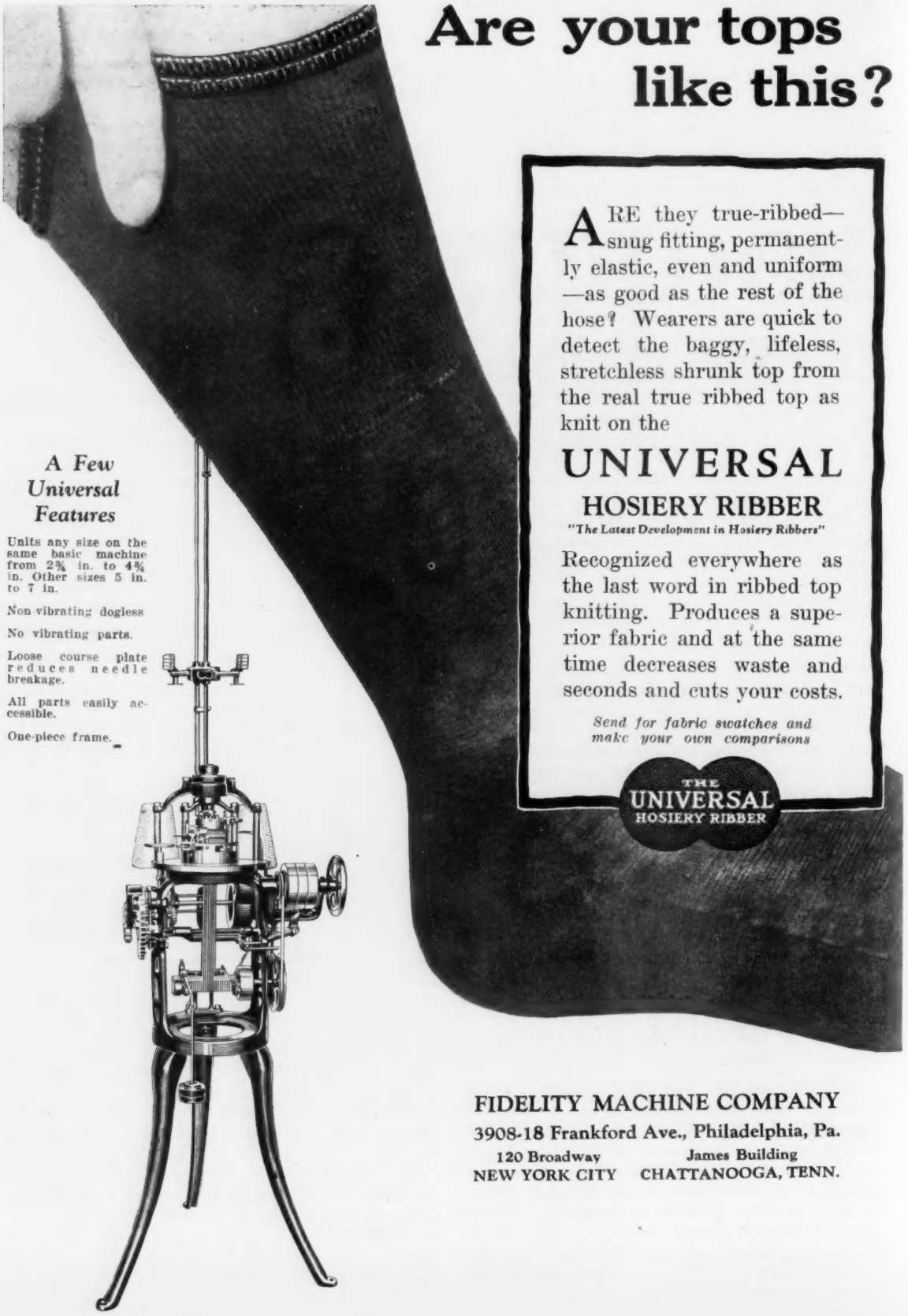
FIG. 2

besides saving the fabric which would be wasted if it were necessary to trim the edge off of the tubing with the electric knife. This allows us to get five full 7-inch cuffs from a tubing finishing 17½ inches after bleaching and dyeing, as is shown by the illustration in Fig. 2. There is almost no cost to this, it is no expense to operate, and it results in a big yearly saving for us. I should be glad to know what the readers of "Knitting Kinks" think of it, and whether they have done anything of this kind which might also be of interest.

R. S. (TENN.)

The dates of the Knitting Arts Exhibition in Philadelphia are March 22-26.

Are your tops like this?



ARE they true-ribbed—snug fitting, permanently elastic, even and uniform—as good as the rest of the hose? Wearers are quick to detect the baggy, lifeless, stretchless shrunk top from the real true ribbed top as knit on the

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Prefers Men Knitters.

EDITOR COTTON:

The question as to "which make the best operatives, men or women," is a very interesting one, and I am therefore offering my experience on the subject.

The nature of the work, of course, has a great deal to do with the matter. My experience has been with operatives on hosiery knitting machines, the operatives taking care of from 12 to 24 machines each, depending upon the nature of the work. From the start we had employed women operatives for knitting, and men to do the machine adjusting. At that time, our main object in view was the wage problem, the women working for less than the men, a condition which prevails in many plants today.

But this practice has been found disadvantageous, due mainly to the fact that the women operatives do not stick to their jobs as steadily as do the men, even under first-class working conditions. Of course there are exceptions to the rule, some women being on the job for several years. However, one disadvantage is that the women are always getting married. Too, they are more emotional than men, and it has been demonstrated that men operatives can handle more machines, get greater production, and with less waste, than can the women operatives.

It is true that men operatives have to be paid a little more than women operatives are paid, but the result obtained in increased production and less waste, more than makes up for the difference.

Another advantage of men over women operatives, is the training of apprentice machine adjusters. It is the problem of every mill to get as an apprentice adjuster someone who has a mechanical turn of mind and who is earnest in his desire to learn the trade. Many disappointments have come about in hiring outsiders for this work. The mechanical condition of the machine is dependent upon the machine adjuster, so if he is not proficient in his work, waste results. This is where the advantage of hiring men operatives comes in. Whenever there is a need for an apprentice, a condition which is prevalent in every mill, there is talent to pick from. Men are more mechanically inclined than are women, so naturally they take a deeper interest in that particular kind of work.

There are of course, some men operatives who do not take as much interest in their work as some women do; in that case they should be eliminated from the department in order to get results.

The management in every mill today must keep costs down to the minimum and get out the greatest amount of production with the least waste in order to keep in the game.

In hiring operatives, several qualities must be taken into consideration at the start. It makes no difference as to what race an operative belongs or what his religious views. His main qualification should be interest in his work, so that when he is on the job he will be busy with his work and not talking with his fellow operatives. He should not be too short or too fat, as this prevents him from picking up his work and threading the machines as quickly and proficiently as is necessary in order to get results. This is a condition I have found in many plants.

No doubt there is a great deal of argument in regard to this question, pro and con, but this has been my experience, and I have come to the conclusion that it is best to have men operatives for this work; pay them a little more than women are paid, in order to keep them on the job, and better results are obtained all around.

This argument, of course, relates only to operatives on knitting machines. In other departments in the mill we find women to be sufficient.

I most certainly would be interested in hearing from some of the readers of this department as to what their opinion is on the subject. RYMI.

Light and Dark Stripes in Half-Hose.

[Editor's Note.—Recently a mill submitted a sample half-hose, dark brown mercerized, containing light and dark stripes across the body of the hose. The sample was submitted to two experts and their opinions as to the difficulty are appended:]

EDITOR COTTON:

With reference to the dark brown mercerized half hose which was submitted because of a defect consisting of light and dark stripes across the body of the hose, will say that in my opinion this trouble was caused by the yarn which went into the hose being unevenly mercerized. As a result, when this hose was dyed that part of the yarn which was not fully mercerized dyed a darker color and the other a lighter color, the dye penetrating more into the unmercerized portions.

I am led to believe this by the fact that the plaiting in the foot of the hose is very bad. The dark stripes appearing across the foot of the hose are much darker than the body yarn, and I believe this condition is due to the mercerizing processes.

Experiment with other makes of yarn which are more evenly mercerized should remedy this condition. I would like to add that the difficulty in plaiting may be overcome by having more tension on the body yarn than on the plaiting yarn. RYMI.

EDITOR COTTON:

In answer to the correspondent who submitted the dark brown mercerized half hose containing light and dark stripes across the body of the hose.

In my opinion, after an examination of the sample, I believe the condition is due either to uneven yarn or to imperfect wetting-out, probably the latter. The sock appears to be dyed with direct dyes, and should have been given a thorough boiling in water before being put in the dye bath. Before passing final judgment, it is desirable that several undyed socks be submitted to see if the unevenness in the yarn can be detected. T. J. (N. Y.)

Eliminating Oil Streaks.

EDITOR COTTON:

Oil streaks on hosiery are a familiar difficulty to knitting mills, and the superintendent is constantly on the job to reduce them. I think, however, that taking it for granted that a good grade of oil is used, lots of men overlook one thing that is responsible for the effect which they attribute to oil.

When a wall, in a Scott & Williams machine, for example, is broken, it is taken out and a new one put in, it being necessary to heat the new one. Carbon of course is formed, and furthermore, the other parts of the machine

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are put back into the machine. I have found it to be a very good point to wash all of these parts with gasoline before putting the machine back together. This removes the accumulated gummy substance and also takes off the flaky metal pieces which may have rubbed off in operation, and which, as I indicated, are to my mind the cause of many stains that lots of people think result from oil.

F. B. (GA.)

A Hidden Cause of Sinker Streaks.

EDITOR COTTON:

I noticed what some readers had to say in answer to a question as to how to stop sinker streaks on 200-needle goods on Model K machines, as published in recent issues in "Knitting Kinks." Their suggestions were good, but I am writing to add one further idea to this discussion, based on my own experience. I have found that streaks will result from the brass head being bent, but not enough to notice it by testing the sinkers. I mean that if a man feels of the sinkers to find out whether the walls are bent, he will be fooled sometimes, as they can be bent enough to make the streaks and yet not enough to bind the sinker. Therefore, I would suggest to those having trouble with streaks which they cannot locate, that they take the brass heads out and examine them for such small bent places which cannot be seen in the machine.

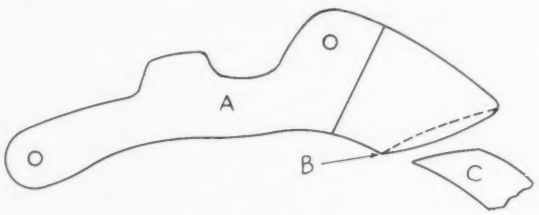
CONTRIBUTORR NO. 4356.

Cut Stitches at Transfer on H-H.

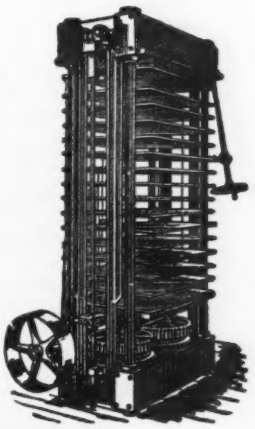
EDITOR COTTON:

This is in answer to the question which appeared in "Knitting Kinks" in January COTTON, asking the cause and remedy for cut stitches at the transfer on an H-H machine.

Cutting in the transfer is due to the cylinder needles striking the bars between the stitches, and is very likely caused by an insufficient slack course. To determine this, the chain should be pulled around so that the auxiliary pawl takes the small rack during the rib to bring the machine into slack course fabric without making the transfer and make a piece of slack fabric. This should stretch about 1¼ inches wider than the regular rib top and if there are any tuck stitches in it, the defective needles should be removed. If the slack fabric is not wide enough



the sinker cap should be set forward in order to bring the pressure of the cam marked *A* in the accompanying sketch on the fabric sooner. If the sinker cap is already set well forward, the front part of the cam *A* can be ground to the dotted line without taking any from the point *B* so that cam *A* can push the sinkers in further without changing the adjustment of the cam *C*. The machine should be adjusted so that the cylinder needles come up through



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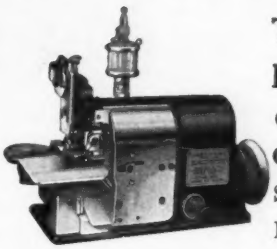

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the stitch behind the one on the cast-off.

As a sample of this mill's hose was sent to me, I might add in connection with this question that more or less difficulty will be experienced on the yarn which is used in this stocking, as it is very uneven and a thick spot in the yarn at the slack course will fill up the stitches so that the cylinder needles may lift the fabric instead of protruding through the stitch. E. M. (N. Y.)

Using Crocus Cloth Instead of Emery.

EDITOR COTTON:

In connection with removing burrs and sharp places from brass parts used in the knitting mill, cylinder walls, etc., I use a method which may be of interest. Most mills use an emery cloth, usually OO cloth. Recently I secured some crocus cloth, and like it better than emery cloth for this purpose. It is finer than fine emery cloth, and it polishes without cutting or scratching, which gives it a big advantage over emery cloth in polishing up brass cylinders, etc., where it would be harmful to cut or wear down the surface. Crocus cloth can be secured from any mill supply house, and I believe if the knitting mill man will give it a trial, he will like it for the reasons mentioned.

F. S. D. (GA.)

Hosiery Dyeing.

(*Continued from page* 391.)

sity of the bath when first made up will not show more than about 1 degree Tw. For the first two or three dyeings this will suffice and no trouble will be experienced if the other instructions are carefully followed. But when we come to the standing bath the density is very important. The Twaddle meter should register 3 to 4 degrees; if it is less than 3 degrees from 5 to 10 per cent of salt should be added. In some cases, especially where a rather short dye liquor is used, it will be found that the density is going up in spite of the fact that no salt has been added. This is due to the sodium sulphide in the bath which is gradually converted into glauber salt. To remedy this condition one-quarter to one-third of the volume is drawn off and then brought back to the original volume with water.

Regulating the Shade of Sulphur Black.

The shade of sulphur black can be regulated by the amount of sulphide of soda and salt added to the dyebath. Too little sulphide of soda and too much salt tend to produce a rather reddish shade. With a still greater excess of salt the black will become bronzy. When sulphur black is reddish, brownish or bronzy the density is too high, and in order to correct this, the amount of salt added should be reduced or omitted entirely. If this does not prove effective the bath should be diluted somewhat, and an extra addition of dyestuff and sulphide of soda added to make up the proper proportions.—*Color Trade Journal.*

"Rayon—A Chemical Fiber" will form the subject of a joint meeting to be held in Atlanta, Ga., on March 18th, by the Georgia sections of the American Society of Civil Engineers, American Institution of Electrical Engineers, and American Chemical Society, it is announced by Paul Seydel, chairman of the program committee.

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An Even Drag Despite Conditions

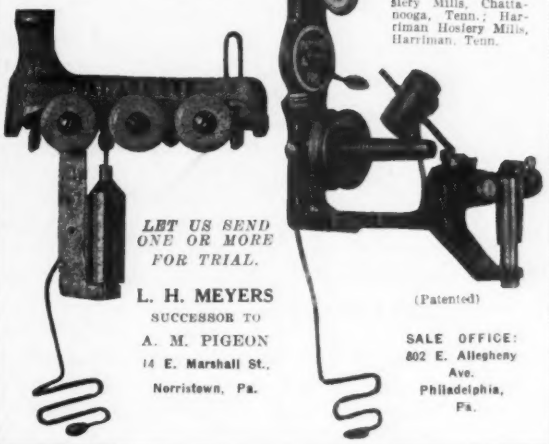
Working automatically, Pigeon Compensating Yarn Tensions tighten drag on light or dry spots and release on heavy or wet spots, assuring an even tension at all times.

Even lengths, perfect plaiting, and smooth weave are obtained.

Applied to all circular hosiery knitting machines. Invaluable for Plain or Reverse plaiting.

Southern Mills Equipped with Pigeon Compensating Yarn Tensions

United Hosiery Mill Corp., Chattanooga, Tenn.; Dalton Hosiery Mills, Dalton, Ga.; Browning Hosiery Mills, Chattanooga, Tenn.; Harriman Hosiery Mills, Harriman, Tenn.



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160 Fifth Avenue New York

The Yarn Market

Philadelphia, Pa., January 18th, 1926.

Since the last report here, a new year has been encountered and an extended holiday season experienced, and these two events always have their effect upon the Philadelphia cotton yarn market.

Generally speaking, during the past month the trend in the market has been to a reasonably higher level of prices, which apparently is now still on the up-grade. The actual causes for the rise, when definitely ascertained, will determine to a large extent the swelling wave's permanency —which just now is a matter of conjecture.

A specific comparison of rates as published last month, with those here appended, would seem to contradict the record that yarn prices are rising; in fact, today's level is below that of a month ago. In the meantime, however, a new low basis was reached, and the improvement in question is figured from that low point. A receding price range, beginning something over a month before the end of the year, reached its bottom just at the turn of the year, with 1926 finding the market at the lowest level of the preceding year.

Due to holidays, inventory, and other factors, the last half of December was a very sluggish period for the market. Business was being transacted, but upon a small-lot, fill-in basis, which brought its usual concomitant of dickering over prices and considerable trading, according to report, and interest from both sides dwindled down as the year drew near its close, and as stated, the low levels resulted.

With the advent of the new year, prices almost simultaneously took a new lease on life, and the movement has been decisively upward to this writing. In this market, the view is that the rise may be classed more as temporary than permanent, it being explained that it is a reflex from the strengthened position of cotton recently. The unusually large crop now practically assured, it is pointed out here, is certain to bring a recession in cotton rates, and that will result in lower yarn values. Even with cotton remaining practically at its present strength—and in these quarters no expectation for a continued rise is voiced —it is contended that yarn prices will be pared off.

There has been very little comment heard as to the influence to be exerted upon yarn prices as a result of the exceptional amount of low-grade cotton reported to constitute quite a percentage of the large yield. Whether the scarcity of the best grades as a result of this situation, with a premium on them, will affect to any extent the situation in this market, has not been definitely determined as yet. It seems certain that should a dearth of the kind of cotton for the better grades of yarn develop, prices will be influenced in some proportion.

In contrast with the more or less bearish attitude reported is the undeniably strengthened position of the spinning division as compared with twelve months ago. Reports from spinning centers are to the effect that in casting their accounts at the opening of the new year, the yarn manufacturers found themselves better situated as to a margin of profit, it being declared that present prices represent very nearly replacement value. It is pointed out that this condition has resulted from a prudent regulation of production in accordance with orders, and this being the case, the spinner's position is considerably more influential than it has been for some time.

Various reports are heard as to the condition of the spinners' order-books, ranging from statements of practically no forward business to claims of being sold well into the future. It is a well-understood fact, however, that an increasing number of mills will be found with reduced amounts of yarn made up awaiting disposal. It is equally agreed that the yarn consuming trades, while using yarns, have not made any general big arrangements for future business, and something interesting is calculated for the near future in this direction.

At the present time, generally speaking, both the yarn manufacturing and consuming divisions are more concerned with inventory as an immediate question.

Philadelphia quotations on January 17th follow:

Single Skeins.

4s to 8s	34	10s	34½
12s	35	14s	35½
16s	36	20s	36½
24s	39 @39½	26s	40 @40½
30s	42 @42½		

Single Warps.

8s	34	10s	34½
12s	35	14s	35½
16s	36	20s	37
26s	41	30s	43
40s	53		

Carpet and Upholstery Yarn in Skeins.

8s 3-4 hard white warp twist	32½@33
8s and 9s 3-4 tinged tube	29½@30
8s 3-4 hard twist waste	28½@29

Two-Ply Skeins.

8s	33½	10s	34
12s	34½	14s	35
16s	35½	20s	37
24s	40	26s	41
30s	43	40s	51

Two-Ply Warps.

8s	34½	10s	35
12s	35½	14s	36
16s	36½	20s	37½@38
24s	40 @40½	26s	41 @41½
30s	44	40s	52½@53

Frame Spun Carded Yarn on Cones.

8s	33½	10s	34 @34½
12s	35	14s	35½
16s	36	18s	36½
20s	37½	22s	38½
24s	39½	26s	40½
30s	41½	40s	52 @53½
30s double carded			42@43
30s tying-in			40@41

Two-Ply Combed Peeler Skeins and Warps.

8s to 16s	54	20s	55
24s	57½	30s	60
40s	70 @72	50s	80 @82
60s	88 @90	70s	97 @$1.05
80s	$1.12@$1.15		

Single Combed Peeler Yarn on Cones.

18s	50 @51	24s	54 @55
30s	60 @61	36s	64 @65
38s	67½@68	40s	69 @70

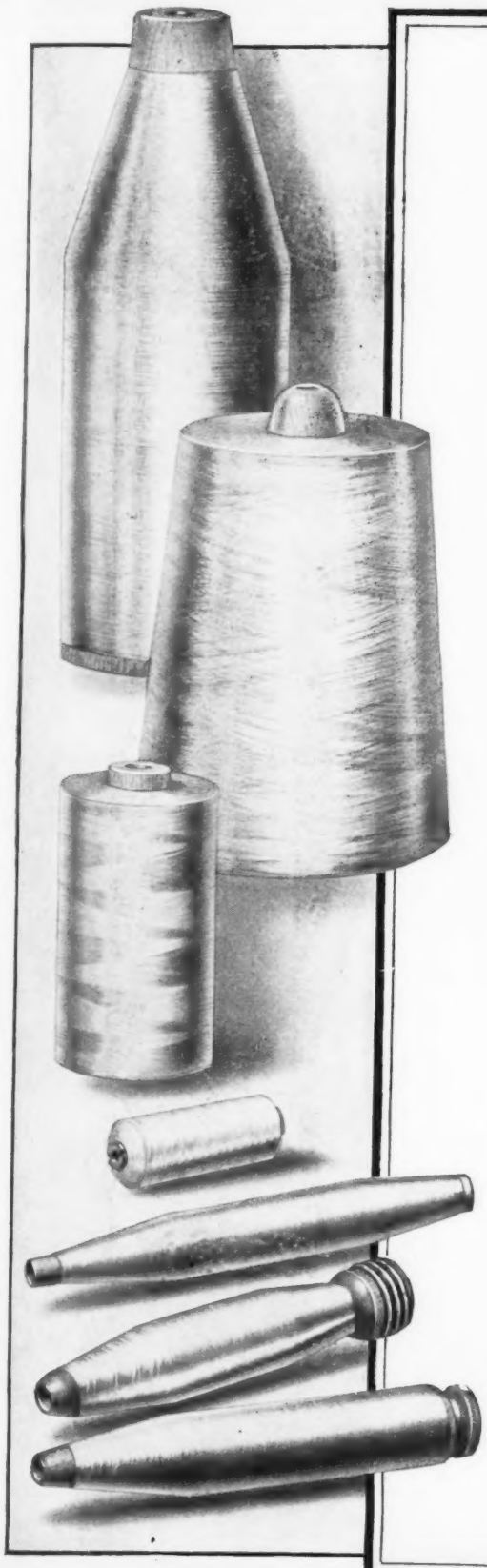
Mule Spun Carded Yarn on Cones.

10s	40	12s	41
14s	42	16s	43
18s	44	20s	46
24s	47	26s	48
30s	49	40s	57

Mule Spun Combed Peeler Yarn on Cones.

10s	50	12s	51
14s	52	16s	53
18s	54	20s	55
22s	56	26s	60
28s	61	30s	62
36s	64	38s	67
40s	70		

General Electric Company, Schenectady, N. Y., have issued a bulletin describing their electric motor drive for looms. These motors, it is pointed out, are totally enclosed, and are designed for the low operating temperature and inherent reserve capacity essential for breaking in new looms and taking care of variations in the class of goods woven. Views showing typical weave rooms equipped with individual drive are included in the bulletin.



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Universal wound Rayon is the practical, efficient and economical supply for your machines. Let us demonstrate this at your mill.

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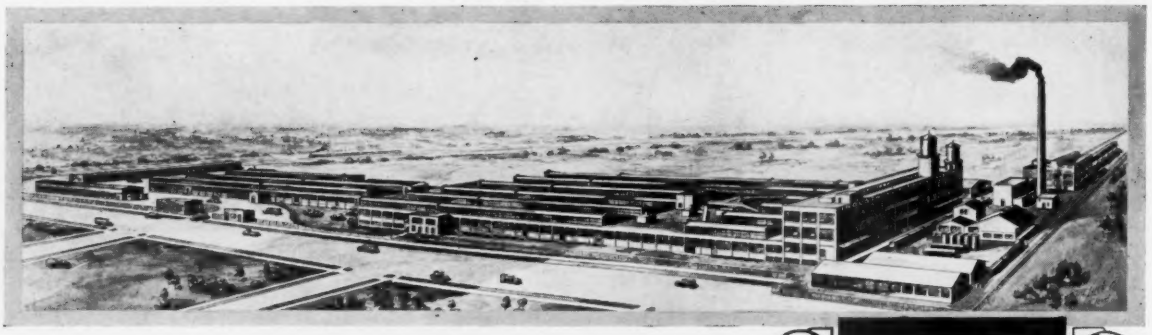
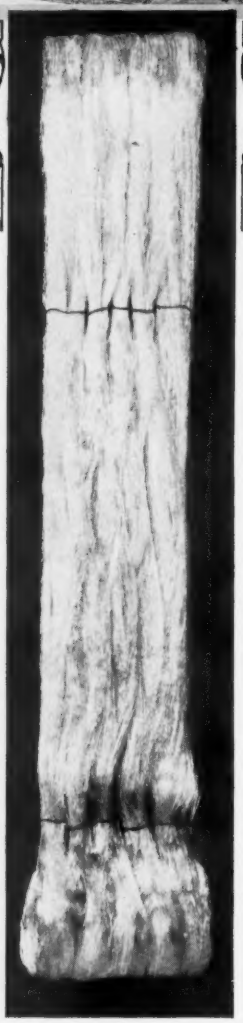


Plant of the Industrial Fibre Company recently enlarged greatly to take care of increasing demand.



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THE growing popularity of "Industrial" Rayon is alone responsible for the recent increase in capacity of the plant, and for our plans for still further expansion.

More important still is the increase in capacity for scientific research. Nothing less than "the best rayon obtainable" will satisfy our chemists and engineers and this program necessarily called for greatly improved laboratory facilities.

We are therefore equipped to turn out not only a much larger quantity, but a much finer quality of yarn than ever before.

We look forward confidently to 1926 as a year of far greater service to our customers.

The INDUSTRIAL FIBRE COMPANY Inc.

148 MADISON AVENUE

NEW YORK CITY

The Knit Goods Market

The knit goods primary markets have taken on much of their 1925 activity. Fair recovery from the holiday lull was noted in January, and by the middle of the month there was renewal of general interest in practically all lines of hosiery. Underwear has had a right good start, although it cannot be said that jobbers are placing large contracts for heavy weights, while in summer weights there is a waiting for the signal from retailers before duplicate business will be offered in any material volume. Sweaters appear to be the last item in the three major divisions of knit goods to feel the stimulus of a generally prosperous condition in most lines of trade.

Two classes of women's hosiery concerning which there is some speculation are latch needle silk and the all-rayon. As to silk in combination with rayon, there seems to be a concensus of opinion in its favor, particularly as relates to well known branded lines of high standards of construction. In silk lines both latch and spring needle mills as a class had not been so well engaged as some months ago, and manufacturers were not so prompt to advance prices as were the full-fashioned mills.

Some interests insist that a really meritorious latch needle silk stocking to sell in retail stores at a dollar a pair cannot be produced profitably to manufacturers, and that as that is the top figure for this type of construction it might as well be discontinued for the time. It is stated by a few jobbers, however, that 260 needle silks made on latch needle machines still are available. It must be apparent that unless raw silk recedes in value, supplies of such hosiery soon will be exhausted and will not soon reappear.

An interior Pennsylvania manufacturer is putting out a 10-strand latch needle stocking that sells at the counter for 75 cents a pair, and the mill is said to be having a run on it in some of the larger cities where price competition among retailers is keen. It is sold direct to the retail trade, under the manufacturer's brand, and the fact that it bears a well known trade mark doubtless accounts in large measure for its success. The length of the boot is not stated.

The same mill produces dollar spring needle silk boot hosiery in service and chiffon weights. The latter was brought out but recently, and as chiffons promise to be even more extensively worn this year than last, it should find a wide open market.

Outside that broadening circle of full-fashioned enthusiasts there is manifest much confidence in circular knit hosiery for women, but, it is believed, it must be kept in the dollar-a-pair classification and represent the acme of perfection for goods in this division. Its better outlet necessarily will be in sections where there is much idleness by reason of strikes in industry and no great activity in building construction. The lower price goods for some time have been the leaders in demand for the anthracite coal regions, where to the middle of January there had been 20 weeks of continuous idleness of more than 150,000 miners at a wage loss amounting, according to various estimates, to around $15,000,000 a week.

As indicating what the strike means in loss of business for jobbers supplying retailers in the anthracite zone, some of the Philadelphia houses have fallen back about 40 per cent since the first of September, making comparison with the corresponding period of the previous year. Many orders that had been placed subject to cancellation in the event of a strike were recalled promptly following the cessation of work, this applying to hosiery, underwear and sweaters, as well as most textile lines. Merchants since have been buying cautiously and some are paying strictly cash or do no buying, for credits in the strike-affected districts have been badly shattered. Some of the road salesmen have not been covering the territory for several months.

Despite the coal strike, jobbers last year, in eastern territory, moved out more hosiery than in 1924. Their gains came from the agricultural and manufacturing centers. Some of the jobbers in the Central West, it is stated on seemingly good authority, handled less silk hosiery. This is attributed to the activities of canvassers and continued development of the business of chain stores. The latter are crowding hard on the single unit small stores and are said to be having an adverse effect on the sales of hosiery in department stores.

The big chains have been the salvation of manufacturers of average staple lines of hosiery. They are big buyers and pay their invoices promptly. But, say some manufacturers, they are becoming a harder proposition as they take a more important place in distribution. Their buyers exact minimum prices from sellers, realizing as they do that their trade is much sought after. Some few mills which have had chain store experience are no longer desirous of doing business with the syndicate establishments.

It is pointed out by manufacturers preferring the steady jobber trade that as the chains expand they will cause a thinning in the ranks of both jobbers and retailers of hosiery and will be in position to virtually dominate mills. When that comes to pass, if ever it does, it is contended, competition for the chain store accounts will be as keen as it has been for those of the better class of jobbers; that the small mills will find harder sledding and the big ones forced to operate on narrowed margins of profit.

Some of the chains, it is no secret, are selling as good silk hosiery at $1.15 to $1.25 a pair as is sold in many retail stores at $1.50. They can do this, of course, because they buy at prices paid by jobbers. They are especially good customers for manufacturers of spring needle silk and light weight full-fashioned. A small spring needle mill in Philadelphia is operating day and night and is sold ahead to the end of April. There is an explanation for such a condition in this mill while some are in need of business. It is getting the same price for goods for the current season as it was almost a year ago, not withstanding raw silk last month was costing manufacturers about 90 cents a pound more than in April, 1925. The management say they bought silk early and advantageously. It is known, however, that the mill for some time has been buying the fiber on the hand-to-mouth basis, and therefore must have paid around the high market.

An obstacle to activity in silk hosiery for a time in January was due to the fact retailers and jobbers were striving to reduce their stocks of wool goods, which in many sections did not have a good season. It was reason

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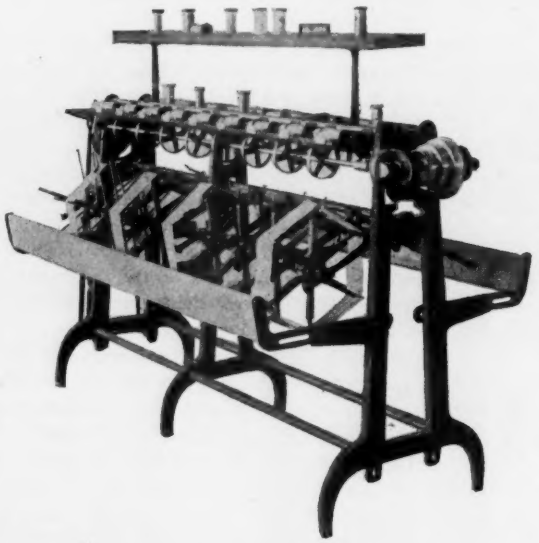

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ed that wool hosiery not moved out in January probably would have to be carried over for next winter. Another explanation for the deferring of orders for silks was the uncertainty as to color style. This is a problem that will not be disposed of except by easy stages. Changes will be gradual and probably not radical, so that almost any prevailing color doubtless will be readily salable before new colors have become established. But buyers must have some pretext for making distributors of manufacturers, and have no difficulty in setting up a reason when none exist.

Hosiery of silk and rayon in combination looks like one of the better guesses as to fabric for the coming seasons, but it does not appear that the all-rayon is destined to make much headway in women's lines. One of the largest orders placed in recent years, by a chain store, was for silk and rayon full-fashioned. It ran beyond $1,000,000 and was given to a Pennsylvania mill. The chain probably can sell this stocking at the price of the circular knit silk-and-rayon in small retail stores. Another prospective big seller is the form fashioned stocking, the descriptive term applied to a combination of the full-fashioned foot and circular knit leg, with mercerized yarn top.

Among manufacturers of the more exclusive types of full-fashioned silk it is stated there is such a strong trend to the all-over silk that there must be a materially lessened consumption of lisle and mercerized yarn for hosiery purposes. The all-over silk is an aftermath of the receding skirt. Observers say that in the "smart set" the knee is exposed to a point where the processed cotton top is joined to the silk portion of the leg, leaving a line showing slightly differing shades of color, something that is not easy to overcome in the dyeing of the two fabrics, it is stated. Some circular knit manufacturers say that if women must have the all-over silk stocking it can be as readily made in their plants as in full-fashioned mills.

The cost of the all-over silk, some say, need not be materially greater than that of the lisle top stocking, as the tendency is to lighter weight fabric, so that although more silk fabric would be required the added cost would be about offset by the use of fewer strands. On the other hand, it is pointed out that woman is willing to pay a trifle more as the penalty for keeping abreast of fashion, and as she is wearing out each year more pairs of chiffons than would be required to keep the wardrobe supplied if she used service weight stockings instead, she is educated to the expending of more than was her custom. Style is taking care of the greater output of silk hosiery.

More of the finer gauge silk hosiery is to be worn this year. This is clearly indicated by the heavy installation of 42 gauge machines to almost the exclusion of 39 gauge. Nearly all of the new equipment placed last year and to be placed in the course of a few months in mills in Philadelphia and adjacent territory is of the finer gauge. As the machines comprise more sections, the increases in production will be, as a matter of course, larger than indicated by the number of machines. Then, too, there is a gain in output per unit as a result of having operatives ignore some of the regulations of their organization.

A Philadelphia mill, by paying a bonus on production, has no difficulty in finding knitters eager to work overtime. Two others have organized in their working organizations building and loan associations, in which employees invest a small part of their earnings each month. Another

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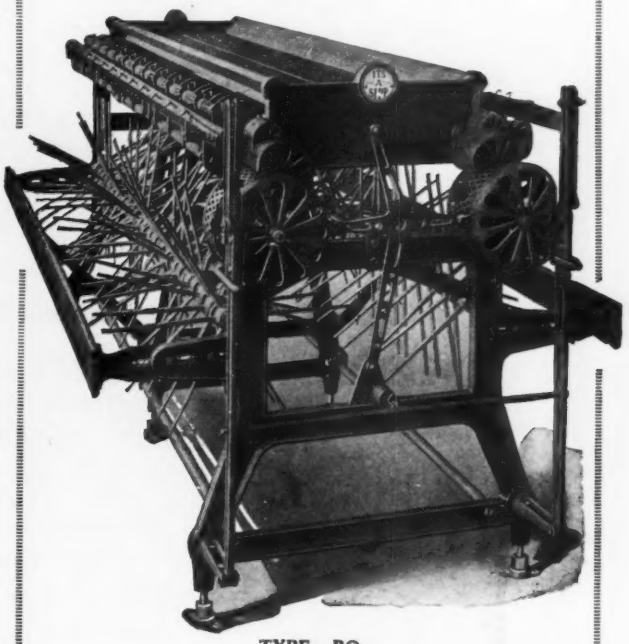

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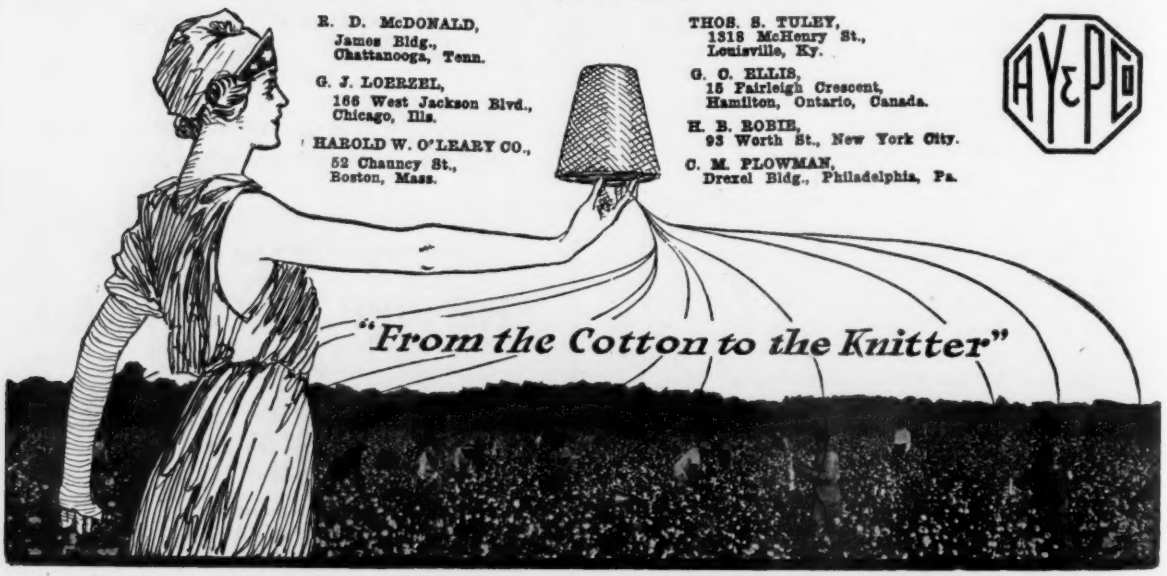


employs only such help as is trained in its factory, run as an open shop, encouraging larger earnings and thrift as well. This mill has a long waiting list of applicants for places as learners.

There are several mills owned and operated by members of the union who themselves do not observe union rules and are profiting in a larger output. It is apparent therefore that hosiery production is expanding to a greater extent than is shown in the mere addition of equipment. Some say it is in danger of being overdone. It will be, some day, but probably not in the year 1926, and the prediction is frequently heard that by the time manufacturers in the North have reached the limit of safety there will be more full-fashioned plants in the South.

That the movement of the hosiery in that direction is gathering some momentum is indicated in the establishing of mills in North Carolina by two Philadelphia hosiery manufacturers and the recent removal of the machinery of an underwear plant in Reading, Pa., to Alabama. A hosiery manufacturer in Reading last month looked over several sites that were offered in Georgia, and should he decide upon removal, he says, he probably will select Columbus. His line is fancy half-hose.

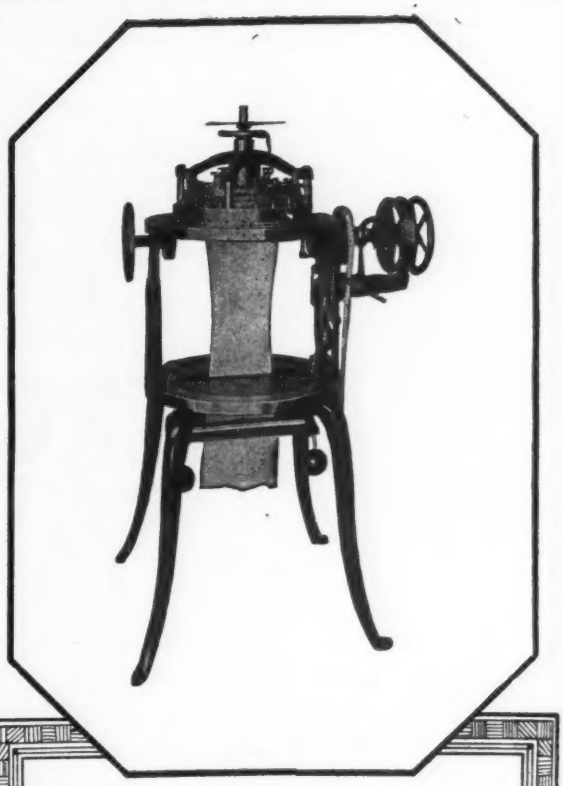
Novelty half-hose is perhaps the more active of all hosiery lines. A manufacturer last month was in search of a mill prepared to make fancy socks to be sold to the retail trade. He believes he has a profitable outlet for attractive lines, but he lacks the facilities for making them in competition with mills which have been established several years.

All doubt as to whether novelty socks for men will be extensively worn this year has been removed by the elaborate preparations made by the distributing trade for the biggest season ever. The novelty sock mill that is not sold well ahead either is not specializing in moderate price goods or is producing patterns which do not strike the retailer fancy. Whether selling to jobbers or retailers, manufacturers of striped socks in fetching designs which can be passed over the counter profitably at a half dollar a pair are committed for deliveries to the end of Spring and some have sold into Summer. Retailers are buying further ahead than has been their custom and are supplying specifications with remarkable promptness. This, however, is something that cannot be dodged by dealers wanting the pick of patterns, for the average manufacturer limits his production of any one and makes little preparation for repeat orders, as a new pattern is brought out each month.

While for a time knitted-in stripes in half dollar socks were either vertical or circular—seldom both—now many of the 50-cent lines knit the up-and-down and the circular, and obtain an additional color or two in the dyeing of mercerized yarn and rayon.

With the absolute certainty of further modernizing of circular knitting machines, it would appear that novelty half hose is but at its beginning as a big merchandising proposition. The mechanical engineer and designer of hosiery are working hand-in-hand.

The higher-priced fancy socks in summer weights are viewed as feasible as a side line for manufacturers having a varied product, but not attractive for an exclusive run, as they cannot be sold in sufficient volume to make their production really profitable, it is stated. This seems to be borne out by the experience of a manufacturer selling to jobbers who covers the price range from 50 cents to one



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dollar. It is the half dollar number that constitutes the mill's bread and butter. Those to go over the counter at 75 cents and a dollar respectively are fill-ins. They are in very light demand, while the other is an every-day seller.

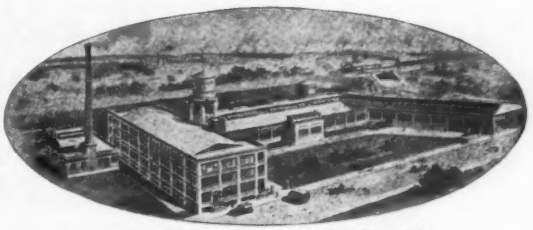
One of the large mills in Reading makes as its lowest price number one that retails at 75 cents, and is reported sold well into the late spring months. But, in comparison with the output of men's and women's plain silk, its production is not large. The busier Reading mill, it appears, makes only half dollar fancy socks and brings out a new pattern before an old one wears out. A direct-to-retailer manufacturer following the same procedure and also concentrating on the 50-cent sock is in the very busy class. He does not dispute the theory that a sport will pay a dollar for a noisy stocking, but takes the stand the 50 cent sports greatly outnumber the dollar ones, and that volume is more desirable than exclusiveness.

Production of plain silk half-hose has been steadily declining, and it does not seem likely it will this year recover much if any of its lost ground. Competition among mills making the plain silk for the jobbing trade is rated very keen, in fact, it has not been deemed expedient to advance prices commensurately with the increase in the cost of raw silk. Several split foot lines were moved up last month by 12½ to 25 cents a dozen, to $3.62½ and $3.75 respectively, regarded as awkward prices, as being too high for a 50 cent number and unnecessarily low if they are to go over the counter at 75 cents. A 12 strand line, of very high grade, has been going to jobbers at $4.50, but probably will be moved up a trifle. It is understood a leading northern manufacturer contemplates putting out an eight strand number to retail at a half dollar.

Little is heard of plain rayon half hose, nor is there any excitement in mercerized and combed lines. Women's high grade lisle, from foreign mills, has been commanding a fair share of attention from exclusive shops. Probably a better proposition than either of these is low end carded half hose, prices for which have continued fairly steady. But there was offered last month a cleanup lot of 220-needle transfer top carded socks, weighing about 12 ounces to the dozen, at 77½ cents in the gray. They could be dyed and finished and put over well under the market, if there be any demand for carded half-hose finer than 176 needle, now on a price parity with 144.

In none of the divisions of hosiery, it appears, is there a more satisfactory market situation than in juvenile lines. Misses' sports hose are a subject of repeat orders, most jobbers having made a cleanup of their initial contracts. At least one well known mill last month was returning repeat orders for confirmation on later shipping dates, and they have come back, in most instances, revised as to shipping instructions. This is one of several mills which did not revise prices some time ago when some came out with a reduction of 25 cents a dozen. Its line seems to fit in with the price put on it at the opening. Some of the all-rayon seven-eighth lengths are having a strong run, in contrast with a weaker situation as to lower prices, of mercerized yarn.

With one Philadelphia mill, jacquard hose for juveniles is proving a tremendous success. It has attracted so much attention in the trade that it seems probable other manufacturers will have it in their lines for the next season. There is some question of the expediency of undertaking to displace the derby ribs with jacquard patterns,



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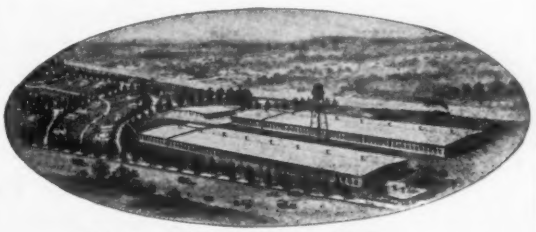

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except in boys' golf hose, for it is foreseen that production might easily be carried too far, leaving mills with machinery for which they possibly would have little use. The comparatively few which went into the jacquard game in a large way have fared well, but this is equally true of some of those which adhered to the fancy top ribs, a better guess for a long run, it seems.

Underwear.

There was some disappointment in January over the apparent indifference of the jobbing trade toward men's ribbed cotton underwear for the next heavy weight season. From the fact fairly good business had been placed in the weeks following the opening by southern manufacturers, it was believed the trade would operate as freely in northern lines. Many buyers placed sample orders, few comparatively going further than that. There had been a waiting for cotton to become steady on a low level.

That was one explanation for jobbers keeping hands off. Another was, while they wanted lower prices, they could not afford to invite downward revision while they still had stocks to be moved out this season. As it was retailers, buying mostly to patch holes in their meager stocks, were wanting to know why they were being "held up" for previous prices after there had been a drop in cotton. Almost while they were wrestling with this question cotton moved to higher levels and jobbers began to breathe more freely, and when they assembled for the annual convention of the National Wholesale Dry Goods Association it soon was made evident they were about ready to do business in the primary market. That was the beginning of a buying move, and there is strong confidence that by the end of February there will have been placed a big initial order business.

Buyers made it apparent very soon after the opening that they would resist to the last ditch the advance over last year's prices announced by one manufacturer of fleeced cotton suits and shirts and drawers. The manufacturer in question came out after a very few weeks with a slightly downward revision and a departure from contemplated selling terms. Jobbers were inclined to view this as a vindication of their attitude, and some felt encouraged to wage war on prices generally. There emanated from sources reports of price reductions here and there, but they failed of their object if the purpose was to stampede manufacturers. It is not doubted there was some cold blooded buying back of closed doors, advantageous to buyers, but in the main, prices of standard lines remain where they were put originally. As the market has gained strength on a nearer approach to stability in cotton, it is felt conditions now are ripe for a relaunching of the manufacturer campaign.

Jobbers who have unbosomed themselves on the subject say they marked their stock underwear down for inventories and have made correspondingly lower prices to retailers. While this seems to have failed as a stimulus for more generous commitments by retailers, it serves to salve over their feeling of resentment to the maintaining of last year's prices to the end of December, when new lists, for new goods, became effective.

A road man for a well known North Carolina underwear mill who returned about the middle of January from his first trip to the Central West for the season, is understood to have booked an encouraging volume of business. He says he found jobbers in that section more ready to go

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Pioneer Manufacturers of
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RAYON
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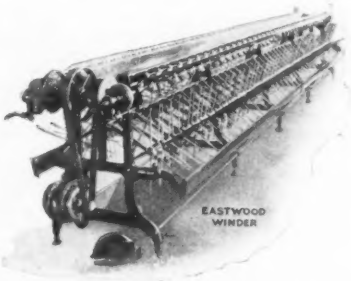
Established 1868
58 Years of Continuous Production



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WINDER
for Rayon, Cotton
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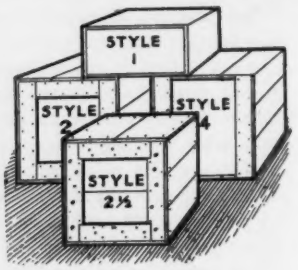

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Twenty-Second Annual

KNITTING ARTS EXHIBITION

Auspices NAT'L ASS'N. OF HOSIERY, UNDERWEAR MANUFACTURERS

COMMERCIAL MUSEUM PHILADELPHIA, PA.

Buyers and Sellers

"get together" for mutual profit at this Exposition.

The bright outlook for the Knitting and Textile trade in 1926 means the attendance of more buyers and sellers.

The wiser firms in the industry are getting in early.

They realize that where there is more "getting together" there will be

MORE BUSINESS!

March 22 to March 26
1926

Personal Direction Chester I. Campbell

ahead than most of those in the East. A 14-pound union suit was especially liked by jobbers.

There is no evidence in the business in men's light weight cotton knitted underwear that retailers are stocking up for spring, and it is the testimony of some jobbers that they have not been compelled to do much buying for replacement. It is believed low-price bal briggans and ribbed light weights have been hurt by price competition in certain branded nainsook lines. For example, the union suit of a well known manufacturer whose brand is known throughout the length and breadth of America was on sale in one or more department stores at 70 cents, special, comparing with one dollar as the indicated retail price. This supplied an incentive for other retailers to cut the price, and some jobbers did likewise. Sales at the special price are said to have run large, a part of the consuming public, it seems, having supplied the wardrobe for summer.

A leading jobber, rather than meet the cut, discontinued the line, and has decided to also discontinue two other brands which figured in the price competition in December and January. The department stores, he says, use the branded lines for leaders, and small retailers cannot compete with them. Numbers of the dealers therefore are passing them up, for brands which to date have been exempt from the cutthroat competition. It is the opinion of some very important factors that "it is a crime for the Federal Trade Commission to stop manufacturers from maintaining resale prices." To thus interfere, it is pointed out, impairs the value of trademarks on which a manufacturer, after heavy expenditures for advertising, has established a profitable business, and benefits only a very small per cent of the consuming public, which pays as much more for some other commodity as it does less for the nainsook union suit, for example, the merchant tacking on where he can to compensate for the paring applied to a leader.

Jobbers as a body say the retail trade is placing fair size orders for the cut-and-sewed underwear of lines carrying no trademark but said to be the equal, in merit, of some that are sold under brands only. Especailly is there interest in rayon-striped nainsooks, as there is also in knitted lines striped with rayon. Novelty in underwear seems to have made more headway in the cut and sewed than in the knitted, doubtless because it was to the former the stripe effect first was given in a general way.

Considering the popularity of silk and rayon underthings, the volume of business coming to manufacturers of women's cotton suits and pants and vests seems amazing. Mills up through the Schuylkill Valley in Pennsylvania are sold well ahead. Manufacturers say they have more and larger orders to date than in 1925, and a few are known to have nothing more to offer for deliveries this side of April. Catalog houses and chain stores are large buyers of women's cotton underwear. They are said to place sizeable initial orders, but expect manufacturers to have goods in stock to take immediate care of repeats, this being true especially of the catalog houses, it is stated by manufacturers.

Schuylkill Valley manufacturers who in the last several years discontinued the manufacture of women's cotton underwear and entered the rayon field are, for the most part, faring right well, several having established a reputation for their rayon garments that serves to keep them in the forefront of producers of this tvpe of garment. Re-

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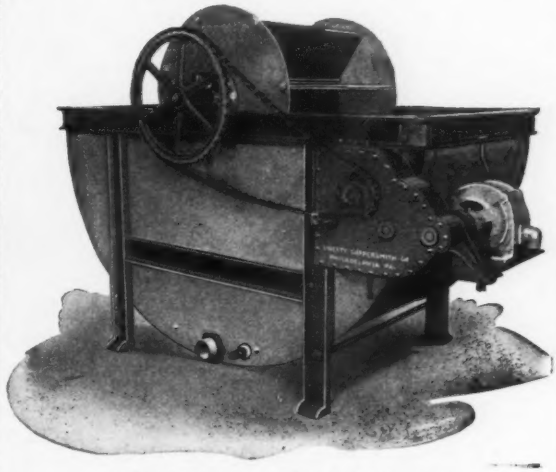

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Marble Nye Company, Boston and Worcester, Mass.

STARCH

tailers still are divided in opinion as to the future of rayon underwear. Those who believe in it are enthusiastic all over, while skeptics are equally set in their opinions.

Sweaters.

It is no reflection on sweater coats as an article for wear or on the zeal of manufacturers and distributors in its behalf to say that business in sweaters is seriously lagging or, at any rate, was to the latter part of January. No one knows what type of sweater coat is likely to be accepted by the public. Manufacturers never showed so many varieties. A road man's samples represents more stock than is carried by many retailers. The more they show the more, it appears, are jobbers perplexed. Only a comparatively few retailers had been heard from last month, and these placed small orders with mills direct. The average department store and woman's specialty shop knows nothing more of the coming vogue than do the manufacturers, and the consuming public knows less and will not make up its mind for some time. So there's little to do but wait for the volume business which all interests firmly believe is around the corner.

Within a period of less than a week in January, salesmen for 73 sweater manufacturers, by actual count of names on hotel registers, were in Baltimore. This meant about 10 salesmen to one buyer—in name. There was little or no business to be coaxed out of the buyers, according to a few of the salesmen telling of their experience in the Maryland metropolis. As many as ten salesmen visited each of several Philadelphia jobbers in a day, and the results there were said to be a duplicate of those in Baltimore.

All interests unite in saying the lumber jack coat will have another big run. But this is not a knitted garment, except as to the shielding band of the windbreaker coat. Men and boys will want the lumberjack, dealers predict, and all foresee a good run for knitted sports coats. But here again the question of style enters. And back of it all is a disposition on the part of distributors to defer commitments until the last moment, for a large part of the trade is not convinced that the decline in wool and worsted yarns has run its course. Whether woman shall reinstate the sweatercoat as a part of her attire will depend on her acceptance or rejection of the two-piece suit, which last year, in bal briggan cloth of a half dozen varieties of construction, gave to the nifty sweater coat the most severe jolt felt by it in many a year.

Among the Knitting Mills.

A test intended to dispose of a moot question in hosiery is being conducted by a Pennsylvania manufacturer, for ascertaining the relative service of, respectively, women's hosiery of the all-silk and the silk-and-rayon boot. Twenty pairs of stockings, comprising one stocking of each construction, were distributed some weeks ago among women who might be expected to give them average hard wear. Thus far, it was stated after the test had proceeded for six weeks, the woman with a silk stocking on one foot and a silk-and-rayon on the other has reported no apparent difference in durability, a similar report being received from each of the women. Laundering did, however, leave a difference in the appearance of the two types of stockings.

With the installation several weeks ago of 12 full-fashioned knitting machines in the mill of the Howard Hosiery Co., Philadelphia, there was completed a transformation that probably is unique in knitting mill expansion. Less than six years ago two brothers of the name of Tait set up a plant comprising 12 Pidgeon machines. This plant has grown to one of 75 Pidgeon machines, to say nothing of the dozen flat machines just installed at a cost of $75,000, and the owners are six Tait brothers, a brother-in-law and their father. Each is in charge of some one department, all working in unison like the cogs of a machine, it is stated, and the boast is made by Samuel C. Tait, the secretary, that practically all of the installation since the beginning has been or shortly will be paid for out of earnings. The entire plant is operating on chiffon hosiery, the spring needle output having been sold up for several months. The retail price of the stocking is a dollar a pair. The full-fashioned equipment is turning off 42-gauge all-over silk chiffons, which fetch $2 in retail stores.

Employees of Thieme Brothers Company, Fort Wayne, Ind., have joined with the executives of the company in an arrangement for group life insurance protection. There are 311 workers and each is to be insured for $1,000. The policy was placed with the Prudential Insurance Company. This protection is of the so-called contributory type, with the workers themselves paying a part of the premiums and the company assuming the remainder of the cost. No medical examination was required because of the large number of persons involved.

Golden Belt Manufacturing Company, Durham, N. C., will, it is understood, install full-fashioned machinery, in a 12-machine unit. Operations will begin by April, it is contemplated.

A new hosiery mill, 350 x 80 feet, will be erected by the Newnan Hosiery Mills, Newnan, Ga. Robert & Company, Atlanta, are the engineers.

It is reported that the McAllester Hosiery Mills, Chattanooga, Tenn., is considering the erection of an additional mill at Cowart and 20th Streets.

The New "Multi Design" Machine.

A tubular machine capable of knitting 90 colors in a single passing of yarn from cone to fabric has been put on the market by the Fidelity Machine Co., Philadelphia. It is an invention of Walter Larkin, well known in knitting machine trades. There is no less limitation of the patterns which may be knitted than to the number of colors made possible by the general construction, it is stated. A 120-needle, 3¼-inch machine may be so constructed as to carry 90 yarn fingers, and each of these will, it is stated, carry a different color, from which it appears that all the fibers used in knitting may be worked side by side, if desired, for obtaining color variation in dyeing. The machine, to which has been given the name "Multi Design," knits flat, and is being installed in mills making fancy tops for juvenile hosiery.

H. W. Anderson is president of the Fidelity Machine Co., which on January 1 took over the Rhode Island Braiding Machine Co., whose plant has been removed to the Fidelity factory. Patents protecting a porcelain covering for cones, for averting waste of yarn in knitting and weaving, recently were acquired by the Fidelity Co. The cover is said to be especially serviceable in the drawing of artificial silk from cones.